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Preset Protocol Specifications Manual

System Training

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Chapter 1 – Introduction

This manual provides information required to understand the ROC Plus protocol and its implementation within the DL8000 Preset Controller ("DL8000"). It is written for personnel needing to implement a ROC Plus Protocol driver in the DL8000 or as a reference to understanding the ROC Plus communications protocols. This manual is intended for users experienced in the development of communication drivers. The protocol provides access to database configuration, real-time clock, event and alarm logs, and historically archived data.

The ROC Plus database is broken into individual parameters. Each database parameter is uniquely associated by parameter number and point type. See *Chapter 3, Parameter Lists for Point Types*, for detailed information.

1.1 Manual Organization

This manual is organized into the following chapters:

Chapter	Description
Chapter 1 Introduction	Describes this manual and provides a summary of the general protocol message format, summary of each opcode, and how to calculate data offsets.
Chapter 2 Opcodes	Lists each opcode the ROC Plus protocol uses.
Chapter 3 Parameter Lists for Point Types	Describes ROC Plus protocol point types and data types.
Chapter 4 CRC-16 Code	Provides information concerning the cyclical redundancy check the ROC Plus protocol uses.
Chapter 5 IEEE Floating Point Format	Provides information about the binary representation of floating-point numbers.
Chapter 6 Spontaneous Report-by-Exception	Provides information on the DL8000's Spontaneous Report-by-Exception (RBX or RBX) function.
Chapter 7 Device to Device Communications	Provides information detailing store and forward options in the DL8000.
Index	Provides an alphabetic listing of items and topics contained in this manual.

1.2 General Protocol Message Format

Figure 1-1 shows the various ROC and host protocol message formats.

General Message Format - Station ‘A’ Polling Station ‘B’ for Data/Action:

Destination (B)		Source (A)		Opcode	Data Length	m Data Bytes								CRC	
unit	group	unit	group		# of bytes	d1	d2	d3	–	–	–	–	dm	LSB	MSB

General Message Format - Station ‘B’ Responding to Station ‘A’:

Destination (A)		Source (B)		Opcode	Data Length	n Data Bytes								CRC	
unit	group	unit	group		# of bytes	d1	d2	d3	–	–	–	–	dn	LSB	MSB

Figure 1-1. General Message Format

A message generally contains the following fields, in order from left to right:

Field	Description	
Destination	Specifies the address for the destination device. Destination has two components:	
	Unit	One-byte unit code for the station address. The unit code for a ROC address is user-configurable. For a host, this must be a unique number. **0** represents “broadcast within group” and **240** is the “direct connect address.”
	Group	Indicates the group code for the station address. This is user-configurable and usually set to **2**.
Source	Specifies the address for the source device. Source has two components:	
	Unit	One-byte unit code for the station address. The unit code for a ROC address is user-configurable. For a host, this must be a unique number. **0** represents “broadcast within group” and **240** is the “direct connect address.”
	Group	Indicates the group code for the station address. This is user-configurable and usually set to **2**.
Opcode	Defines the operation code (opcode) action to perform.	
# of bytes	Indicates the number of bytes in the data byte field, consisting of the path, desired opcode, number of data bytes for the desired message, and the desired message itself.	
Data Bytes	Contains messages of varying lengths, consisting of the path, desired opcode, number of data bytes for the desired message, and the message itself.	
CRC	Confirms validity of message transmission.	

Field	Description	
	LSB	Least significant byte.
	MSB	Most significant byte.

Messages are of flexible length. The first six data bytes are used for the header information including: destination, source, opcode, and data length (number of bytes). The length of a message equals the number of data bytes transmitted plus eight overhead bytes (header information and CRC).

The minimum message length is eight bytes if the number of data bytes is zero (no data bytes transmitted). The maximum message length is 248 bytes (240 bytes of data). A "nibble" is a four-bit unit or half a byte.

Figure 1-2 provides examples of the messages exchanged if the host requests the current time and date from DL8000 13 of Group 5.

Host Request to DL8000:

ROC Address		Host Address		Opcode	Data Length	CRC	
unit	group	unit	group	–	# of bytes	LSB	MSB
13	5	1	0	7	0	1	m

DL8000 Response to Host:

Host Address		ROC Address		Opcode	Data Length	8 Data Bytes								CRC	
unit	group	unit	group	–	# of bytes	d1	d2	d3	–	–	–	–-	dn	LSB	MSB
1	0	13	5	7	8	sec	min	hr	day	mo	yr	lyr	dwk	l	m

Figure 1-2. Request/Response Example

Note: Addresses **240,240** and **0,x** are reserved and should not be used.

1.3 Broadcast

DL8000 firmware version 1.10 and higher supports message broadcasting. A broadcast message is an opcode that is sent to a unit of 0. In this case, all DL8000s with the group matching the request accept the opcode and process it (regardless of the unit designation that each DL8000 may have). The DL8000 does not respond to the request.

For example, you may need to synchronize several DL8000s to the same date and time. If the DL8000s were connected to the same radio link and configured for the same group, a host could send an opcode 8 (Set Real-Time Clock) request to Unit 0 that would then set all of the DL8000s configured in this group to the same date and time.

1.4 Calculating Data Offsets

A data byte offset is the offset (zero-based) from the beginning of a transmit or receive buffer for the data items that comprise the opcode data. The offset of the first data item is always **6** to allow for the header information (bytes 0-5).

Certain data offset values are determined based on the DL8000's configuration, such as for Opcode 0. The data byte offset for each item may be calculated. To calculate the next data offset value, add the previous offset value to the length of the previous data item:

Offset = Previous Offset + Length of Previous Data Item

Chapter 2 – Opcodes

This section details each opcode for the DL8000 preset protocol.

2.1 Opcode Overview

Table 2-1 summarizes each opcode. The tables in this section provide detailed descriptions of the various opcodes used. For each opcode, a brief description of the data bytes is provided. In some cases, the number of data bytes returned for an opcode varies. For example, Opcode 0, a full update, always returns certain input/output (I/O) information along with optionally specified data.

Certain opcodes only send data and do not receive data back from the DL8000. For example, Opcode 8 requests the DL8000 to set the time and date. The host transmits six to nine data bytes defining the new time and date. The DL8000 resets the time and date and sends back an acknowledgment in which the opcode is repeated, but no data bytes are transmitted back. All acknowledgments are 8-byte messages that repeat the opcode received, but do not transmit any data bytes.

Opcode 255 is an error message indicator. This is also an 8-byte message with no data bytes included. The opcode is set to 255 to indicate the message received by the DL8000 had valid Cyclical Redundancy Check (CRC), but contained invalid parameters. For example, if a request was made for information on Analog Input #11, but the DL8000 was configured for only eight analog inputs (0 to 7), the DL8000 would respond back with the 8-byte message with the opcode equal to 255 (error).

The number of analog inputs varies from DL8000 to DL8000. This variability is indicated by listing the first analog input and indicating the remaining analog inputs by a period ("."). In the following tables, a period in either the Data byte(s) column or the Description of Data column indicates a repetition of the proceeding item for the necessary number of instances.

Table 2-1. Summary of Opcodes

Opcode	Description
6	Sends DL8000 configuration.
7	Sends current time and date.
8	Sets new time and date.
10	Sends data from configurable opcode tables.
11	Sets data in configurable opcode tables.
17	Sets operator identification.
24	Stores and forwards.
50	Requests IO point position array.
100	Reads user-defined point information (Command 11)
105	Sends history point definition, min/max data, and current values for specified history point.
108	Sends tag and current history period for specified history points.
117	Sends specified number of weights and measures events starting at specified event index
118	Sends specified number of alarms starting at specified alarm index.
119	Sends specified number of events starting at specified event index.
135	Requests history point data.
136	Requests history index data.
137	Requests history index for a day.
138	Requests daily and periodic history for a day.
139	Requests various types of information from history.
166	Sets specified contiguous block of parameters.
167	Sends specified contiguous block of parameters.
180	Sends specified parameters.
181	Sets specified parameters.
203	File transfer to and from DL8000.
204	Sends specified number of events or weights and measures events starting at specified event indice (supporting 40-byte old and new value on parameter change)
224	Sends Report-by-Exception (SRBX) message to host.
225	Acknowledges Report-by-Exception message from DL8000.
255	Transmits DL8000 error messages in response to a request with invalid parameters or format.

2.2 Opcode 6, System Configuration

Opcode 6 obtains the current configuration of the DL8000.

Version	Description
1.10	Introduced

Table 2–2. Opcode 6, System Configuration

Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
Opcode 6: System Configura-tion	6		No data bytes	6	1	The system mode the unit is currently operating in. 0 = Firmware Update Mode – Extremely limited functionality is available. 1 = Run Mode
				7	2	Comm Port or Port Number that this request arrived on. This is not defined if the above value (offset 6) is 0.
				9	1	Security Access Mode for the port the request was received on.
				10	1	Logical Compatibility Status – Version 1.10 See [Point Type 91,Logical 0,Parameter 50]: 0 = 16 points per slot (160 bytes total) – Compatibility Mode is 0 & 9 module slots max 1 = 16 points per slot (240 bytes total) – Compatibility Mode is 0 & 14 module slots max. NOTE: The 15th module slot can not be used. 2 = 8 points per slot (224 bytes total) – Compatibility Mode is 1 & 27 module slots max. See Opcode 50 for more information.
				11	1	Opcode 6 Revision 0 = Original (ROC800 Pre-2.02) 1 = Extended for Additional Point Types (offset 104 -220)
				12	12	Reserved for Future Use [zeros returned]

Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				24	1	Type of ROC 1 = ROCPAC ROC 300 series 2 = FloBoss 407 3 = FlashPAC ROC 300 series 4 = FloBoss 503 5 = FloBoss 504 6 = ROC800 (827/809) **11=DL8000** X = FB100
				25	1	Contains the number of logical for point type 60
				26	1	Contains the number of logical for point type 61
				27	1	Contains the number of logical for point type 62
				28	1	Contains the number of logical for point type 63
				29	1	Contains the number of logical for point type 64
				30	1	Contains the number of logical for point type 65
				31	1	Contains the number of logical for point type 66
				32	1	Contains the number of logical for point type 67
				33	1	Contains the number of logical for point type 68
				34	1	Contains the number of logical for point type 69
				35	1	Contains the number of logical for point type 70
				36	1	Contains the number of logical for point type 71
				37	1	Contains the number of logical for point type 72
				38	1	Contains the number of logical for point type 73
				39	1	Contains the number of logical for point type 74
				40	1	Contains the number of logical for point type 75
				41	1	Contains the number of logical for point type 76
				42	1	Contains the number of logical for point type 77
				43	1	Contains the number of logical for point type 78
				44	1	Contains the number of logical for point type 79
				45	1	Contains the number of logical for point type 80

Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				46	1	Contains the number of logical for point type 81
				47	1	Contains the number of logical for point type 82
				48	1	Contains the number of logical for point type 83
				49	1	Contains the number of logical for point type 84
				50	1	Contains the number of logical for point type 85
				51	1	Contains the number of logical for point type 86
				52	1	Contains the number of logical for point type 87
				53	1	Contains the number of logical for point type 88
				54	1	Contains the number of logical for point type 89
				55	1	Contains the number of logical for point type 90
				56	1	Contains the number of logical for point type 91
				57	1	Contains the number of logical for point type 92
				58	1	Contains the number of logical for point type 93
				59	1	Contains the number of logical for point type 94
				60	1	Contains the number of logical for point type 95
				61	1	Contains the number of logical for point type 96
				62	1	Contains the number of logical for point type 97
				63	1	Contains the number of logical for point type 98
				64	1	Contains the number of logical for point type 99
				65	1	Contains the number of logical for point type 100
				66	1	Contains the number of logical for point type 101
				67	1	Contains the number of logical for point type 102
				68	1	Contains the number of logical for point type 103

Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				69	1	Contains the number of logical for point type 104
				70	1	Contains the number of logical for point type 105
				71	1	Contains the number of logical for point type 106
				72	1	Contains the number of logical for point type 107
				73	1	Contains the number of logical for point type 108
				74	1	Contains the number of logical for point type 109
				75	1	Contains the number of logical for point type 110
				76	1	Contains the number of logical for point type 111
				77	1	Contains the number of logical for point type 112
				78	1	Contains the number of logical for point type 113
				79	1	Contains the number of logical for point type 114
				80	1	Contains the number of logical for point type 115
				81	1	Contains the number of logical for point type 116
				82	1	Contains the number of logical for point type 117
				83	1	Contains the number of logical for point type 118
				84	1	Contains the number of logical for point type 119
				85	1	Contains the number of logical for point type 120
				86	1	Contains the number of logical for point type 121
				87	1	Contains the number of logical for point type 122
				88	1	Contains the number of logical for point type 123
				89	1	Contains the number of logical for point type 124

Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				90	1	Contains the number of logical for point type 125
				91	1	Contains the number of logical for point type 126
				92	1	Contains the number of logical for point type 127
				93	1	Contains the number of logical for point type 128
				94	1	Contains the number of logical for point type 129
				95	1	Contains the number of logical for point type 130
				96	1	Contains the number of logical for point type 131
				97	1	Contains the number of logical for point type 132
				98	1	Contains the number of logical for point type 133
				99	1	Contains the number of logical for point type 134
				100	1	Contains the number of logical for point type 135
				101	1	Contains the number of logical for point type 136
				102	1	Contains the number of logical for point type 137
				103	1	Contains the number of logical for point type 138
Included if Opcode 6 Revision (offset 11) >= 1				104	1	Contains the number of logical for point type 139
				105	1	Contains the number of logical for point type 140
				106	1	Contains the number of logical for point type 141
				107	1	Contains the number of logical for point type 142
				108	1	Contains the number of logical for point type 143
				109	1	Contains the number of logical for point type 144
				110	1	Contains the number of logical for point type 145

Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				111	1	Contains the number of logical for point type 146
				112	1	Contains the number of logical for point type 147
				113	1	Contains the number of logical for point type 148
				114	1	Contains the number of logical for point type 149
				115	1	Contains the number of logical for point type 150
				116	1	Contains the number of logical for point type 151
				117	1	Contains the number of logical for point type 152
				118	1	Contains the number of logical for point type 153
				119	1	Contains the number of logical for point type 154
				120	1	Contains the number of logical for point type 155
				121	1	Contains the number of logical for point type 156
				122	1	Contains the number of logical for point type 157
				123	1	Contains the number of logical for point type 158
				124	1	Contains the number of logical for point type 159
				125	1	Contains the number of logical for point type 160
				126	1	Contains the number of logical for point type 161
				127	1	Contains the number of logical for point type 162
				128	1	Contains the number of logical for point type 163
				129	1	Contains the number of logical for point type 164
				130	1	Contains the number of logical for point type 165

Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				131	1	Contains the number of logical for point type 166
				132	1	Contains the number of logical for point type 167
				133	1	Contains the number of logical for point type 168
				134	1	Contains the number of logical for point type 169
				135	1	Contains the number of logical for point type 170
				136	1	Contains the number of logical for point type 171
				137	1	Contains the number of logical for point type 172
				138	1	Contains the number of logical for point type 173
				139	1	Contains the number of logical for point type 174
				140	1	Contains the number of logical for point type 175
				141	1	Contains the number of logical for point type 176
				142	1	Contains the number of logical for point type 177
				143	1	Contains the number of logical for point type 178
				144	1	Contains the number of logical for point type 179
				145	1	Contains the number of logical for point type 180
				146	1	Contains the number of logical for point type 181
				147	1	Contains the number of logical for point type 182
				148	1	Contains the number of logical for point type 183
				149	1	Contains the number of logical for point type 184
				150	1	Contains the number of logical for point type 185

Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				151	1	Contains the number of logical for point type 186
				152	1	Contains the number of logical for point type 187
				153	1	Contains the number of logical for point type 188
				154	1	Contains the number of logical for point type 189
				155	1	Contains the number of logical for point type 190
				156	1	Contains the number of logical for point type 191
				157	1	Contains the number of logical for point type 192
				158	1	Contains the number of logical for point type 193
				159	1	Contains the number of logical for point type 194
				160	1	Contains the number of logical for point type 195
				161	1	Contains the number of logical for point type 196
				162	1	Contains the number of logical for point type 197
				163	1	Contains the number of logical for point type 198
				164	1	Contains the number of logical for point type 199
				165	1	Contains the number of logical for point type 200
				166	1	Contains the number of logical for point type 201
				167	1	Contains the number of logical for point type 202
				168	1	Contains the number of logical for point type 203
				169	1	Contains the number of logical for point type 204
				170	1	Contains the number of logical for point type 205

Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				171	1	Contains the number of logical for point type 206
				172	1	Contains the number of logical for point type 207
				173	1	Contains the number of logical for point type 208
				174	1	Contains the number of logical for point type 209
				175	1	Contains the number of logical for point type 210
				176	1	Contains the number of logical for point type 211
				177	1	Contains the number of logical for point type 212
				178	1	Contains the number of logical for point type 213
				179	1	Contains the number of logical for point type 214
				180	1	Contains the number of logical for point type 215
				181	1	Contains the number of logical for point type 216
				182	1	Contains the number of logical for point type 217
				183	1	Contains the number of logical for point type 218
				184	1	Contains the number of logical for point type 219
				185	1	Contains the number of logical for point type 220
				186	1	Contains the number of logical for point type 221
				187	1	Contains the number of logical for point type 222
				188	1	Contains the number of logical for point type 223
				189	1	Contains the number of logical for point type 224
				190	1	Contains the number of logical for point type 225

Communication Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				191	1	Contains the number of logical for point type 226
				192	1	Contains the number of logical for point type 227
				193	1	Contains the number of logical for point type 228
				194	1	Contains the number of logical for point type 229
				195	1	Contains the number of logical for point type 230
				196	1	Contains the number of logical for point type 231
				197	1	Contains the number of logical for point type 232
				198	1	Contains the number of logical for point type 233
				199	1	Contains the number of logical for point type 234
				200	1	Contains the number of logical for point type 235
				201	1	Contains the number of logical for point type 236
				202	1	Contains the number of logical for point type 237
				203	1	Contains the number of logical for point type 238
				204	1	Contains the number of logical for point type 239
				205	1	Contains the number of logical for point type 240
				206	1	Contains the number of logical for point type 241
				207	1	Contains the number of logical for point type 242
				208	1	Contains the number of logical for point type 243
				209	1	Contains the number of logical for point type 244
				210	1	Contains the number of logical for point type 245

Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
				211	1	Contains the number of logical for point type 246
				212	1	Contains the number of logical for point type 247
				213	1	Contains the number of logical for point type 248
				214	1	Contains the number of logical for point type 249
				215	1	Contains the number of logical for point type 250
				216	1	Contains the number of logical for point type 251
				217	1	Contains the number of logical for point type 252
				218	1	Contains the number of logical for point type 253
				219	1	Contains the number of logical for point type 254
				220	1	Contains the number of logical for point type 255

2.3 Opcode 7, Read Real-time Clock

Refer to *Table 2–3* when using Opcode 7 to return the current time and date, the number of years since the last leap year, and the day of week.

Version	Description
1.10	Introduced

Note: You can also read the time/date by specifying Point Type 136 (ROC Clock) or Opcode 167 (Request Single Point Parameters).

Table 2–3. Opcode 7, Read Real-time Clock

Opcode 7						
Communi-Cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 7: Send Current Time and Date			No data bytes.	6	1	Current second [UINT8]
				7	1	Current minute [UINT8]
				8	1	Current hour [UINT8]
				9	1	Current day [UINT8]
				10	1	Current month [UINT8]
				11	2	Current year [UINT16]
				13	1	Current day of week [UINT8] 1=Sunday → 7=Saturday

2.4 Opcode 8, Set Real-time Clock

Opcode 8 is the only way to set the real-time clock. The DL8000 calculates the current day of the week. When you set the clock, the microseconds in the DL8000 zero out.

Version	Description
1.10	Introduced

Table 2–4. Opcode 8, Set Real-time Clock

Opcode 8						
Communi-Cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 8: Set	6	1	Current seconds [UINT8]			No data bytes.
Current Time	7	1	Current minutes [UINT8]			Time and date are set and acknowledgment sent back.
and Date	8	1	Current hour [UINT8]			
	9	1	Current day [UINT8]			
	10	1	Current month [UINT8]			
	11	2	Current year [UINT16]			

2.5 Opcode 10, Read Configurable Opcode Point Data

Opcode 10 reads data defined by Point Type 99 (Configurable Opcode). The value of the starting table location plus the number of table locations must be less than or equal to 44.

Version	Description
1.10	Introduced

Table 2–5. Opcode 10, Read Configurable Opcode Point Data

Opcode 10						
Communi-Cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 10: Send Data from Configurable Opcode Tables	6	1	Table Number (0-15)	6	1	Table Number (0-15)
	7	1	Starting Table Location (0-43)	7	1	Starting Table Location (0-43)
	8	1	Number of Table Locations (1-44)	8	1	Number of Table Locations (1-44)
				9	4	Table Version Number [float]
				13	x	Data

2.6 Opcode 11, Write Configurable Opcode Point Data

Opcode 11 writes data defined by Point Type 99 (Configurable Opcode). The value of the starting table location plus the number of table locations must be less than or equal to 44.

Version	Description
1.10	Introduced

Table 2–6. Opcode 11, Write Configurable Opcode Point Data

Opcode 11						
Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 11: Set Data in Configurable Opcode Tables	6	1	Table Number (0-7) – (ROC300-Series and FloBoss 407) Table Number (0-3) – (FloBoss 100-Series, FloBoss 500-Series, and RegFlo)			No data bytes.
	7	1	Starting Table Location (0-43)			Acknowledgment sent back.
	8	1	Number of Table Locations (1-44)			
	9	x	Data			

2.7 Opcode 17, Login Request

Opcode 17 sets an operator identification code for the communications port through which communications are occurring. The operator identification is logged with an event, indicating the operator responsible for creating the event. The DL8000 provides a default operator identification for each communications port.

Version	Description
1.10	Introduced

Once you set the operator identification, it remains set until changed by:

- Subsequent Opcode 17 requests;
- DL8000 initialized by a cold hard start;
- Firmware upgrade; **or**
- Timeout.

Table 2–7. Opcode 17, Login Request

Opcode 17						
Communi-cation Opcode	**Host Request to DL8000**			**DL8000 Response to Host**		
	Data		**Description of Data**	**Data**		**Description of Data**
	Offset	**Length**		**Offset**	**Length**	
Opcode 17: Set Operator ID	6	3	Operator ID [AC3]			Acknowledgment sent back without data.
	9	2	Password [UINT16]			
Note: Access Level only sent if Security Mode (95, x, 44) is set to 2 where x = the logical of the port the request is being made on.	11	1	Access Level [UINT8]			
Opcode 17 Logout request	6	3	Operator ID [AC3)			Acknowledgement sent back without data
	9	2	Password [UINT16]			
Note: Logout string is the ASCII string "LOGOUT" in all capital letters	11	6	Logout String [AC6]			

2.8 Opcode 24, Store and Forward

Opcode 24 defines the requested store and forward action through up to three intermediate DL8000s to the final destination DL8000. Refer to *Chapter 7, Device to Device Communications*, for details on how this opcode works.

Version	Description
1.10	Introduced

Table 2–8. Opcode 24, Store and Forward

Opcode 24						
Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 24: Store and Forward	6	1	Host Address			No response to host until message returns from Final Destination DL8000.
	7	1	Host Group			
	8	1	1st Destination Address			
	9	1	1st Destination Group			
	10	1	2nd Destination Address			
	11	1	2nd Destination Group			
	12	1	3rd Destination Address			
	13	1	3rd Destination Group			
	14	1	4th Destination Address			
	15	1	4th Destination Group			
	16	1	Desired Opcode			
	17	1	Number of data bytes for the desired Opcode			
	18	x	Opcode request data (if any)			

2.9 Opcode 50, Request I/O Point Position

Opcode 50 is used to request either the *type* or the *logical number* of all the I/O points in the DL8000, returned in the order of their physical location in the DL8000. The system (diagnostic) inputs are also included.

Version	Description
1.00	Introduced
1.10	Updated

Table 2-9. Opcode 50, Request I/O Point Position

Opcode 50						
Communi-Cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
Opcode 50: Send I/O Point Type or Logical Number associated with the Point Type.	6	1	Which I/O data to send (0 = I/O Point Type, 1 = I/O Logical Number)	6	160 240 224	I/O Point Types or Logical Numbers See Opcode 6 (offset 10) for length of response

2.10 Opcode 100, Access User-defined Information

Opcode 100 reads user-defined point type information.

Version	Description
1.10	Introduced (as Command 11)

Table 2-10. Opcode 100, Access User-defined Information

Opcode 100						
Communi-Cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
Get Point Type Information	6 7	1 1	Command (11) Start Point # (0 – 255)	6 7	1 1	Command (11) Start Point # (0 – 255)
Retrieve information about point types.	8	1	# Points (0 – 245)	8 9	1 1	# Points (0 – 245) Type of Point Type 0 – 7 User Program 253 – User Defined 254 – ROC Point Type 255 – No Point Type (Above repeated as necessary)

2.11 Opcode 105, Request Today's and Yesterday's Min/Max Values

Opcode 105 retrieves the occurrence of today's and yesterday's minimum and maximum values.

Version	Description
1.10	Introduced

Enumeration Historical archive method.

128	Archived every hour (Average)
129	Archived every hour (Accumulated)
130	Archived every hour (Current)
134	Archived every hour (Totalize)
67	Timestamp logged with FST-controlled timestamp. Timestamp is a TIME [UINT32] representing the number of seconds elapsed since 12:00AM Jan 1, 1970. Use FST command WTM (Write Current Time to History)
65	Database value logged when directed by FST command WDB (Write Results Register Value to History)
0	Not defined.

Table 2–11. Opcode 105, Request Today's and Yesterday's Min/Max Values

Opcode 105						
Communi-cation Opcode	**Host Request to DL8000**			**DL8000 Response to Host**		
	Data			**Data**		
	Offset	**Length**	**Description of Data**	**Offset**	**Length**	**Description of Data**
Opcode 105: Send History Point Defini-tion, Min and Max Data, and Current Value for Specified History Point	6	1	History Segment (0 – 10)	6	1	History Segment (0 – 10)
	7	1	History point number	7	1	Historical point number
				8	1	Historical Archival Method Type
				9	1	Point type
				10	1	Point/Logic number
				11	1	Parameter number
				12	4	Current value [float]
				16	4	Minimum value since contract hour [float]
				20	4	Maximum value since contract hour [float]
				24	5	Time of minimum value occurrence **Note**: This is a UINT32 (4 bytes) and contains the number of seconds since 12:00AM Jan 1, 1970. Seconds, minutes, hour, day, and month

Opcode 105						
Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
				29	5	Time of maximum value occurrence. **Note**: This is a UINT32 (4 bytes) and contains the number of seconds since 12:00AM Jan 1, 1970. Seconds, minutes, hour, day, and month
				34	4	Minimum value yesterday [float]
				38	4	Maximum value yesterday [float]
				42	5	Time of yesterday's min value occurrence. **Note**: This is a UINT32 (4 bytes) and contains the number of seconds since 12:00AM Jan 1, 1970. Seconds, minutes, hour, day and month
				47	5	Time of yesterday's max value occurrence. **Note**: This is a UINT32 (4 bytes) and contains the number of seconds since 12:00AM Jan 1, 1970. Seconds, minutes, hour, day, and month
				52	4	Value during last completed period [float]

2.12 Opcode 108, Request History Tag and Periodic Index

Opcode 108 sends the tag and history period for specified history points, up to a maximum of 20 history points. All points must be within a single segment.

Version	Description
1.10	Introduced

Table 2–12. Opcode 107, Request History Tag and Periodic Index

Opcode 108						
Communi-cation Opcode	**Host Request to DL8000**			**DL8000 Response to Host**		
	Data		**Description of Data**	**Data**		**Description of Data**
	Offset	**Length**		**Offset**	**Length**	
Opcode 108: Send Tag and Current History Period for Specified History Point(s)	6	1	History Segment (0 – 10)	6	1	History Segment (0 – 10)
	7	1	# of historical points specified	7	1	# of historical points specified
	8	1	Historical point (0 – 199)	8	2	Periodic Index (common among all history points in segment)
		.	(above repeated as necessary 20 maximum)	(repeated as necessary)	1	History point
					10	Tag [AC10]

2.13 Opcode 117, Request Weights and Measures Event Data

Opcode 117 requests event data from the Event Log in the DL8000. The Weights and Measures Event Log consists of 1000 events. Each event consistes of 22 bytes, organized according to one of the formats described below.

Version	Description
1.10	Introduced

Table 2–13. Opcode 107, Request Weights and Measures Event Data

Opcode 117						
Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data Offset	Data Length	Description of Data	Data Offset	Data Length	Description of Data
Opcode 117: Send Specified Number of Events Starting with the Specified Event Index	6	1	# of events requested (max 10) *SEE NOTE BELOW	6	1	Number of events being sent
	7	2	Starting Event Log index	7	2	Starting Event Log index
				9	2	Current Event Log index
				11	22	Event Data
					.	(above repeated as necessary)

Note: If no events are requested, the DL8000 does not return event data.

Event Data Format The event log stores the last 1000 event entries. Each event consists of 22 bytes and has the following general format:

Description:	Type	Time				Event Specific Data																
Byte:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Weights and Measures Event Type Identifies what type of event is stored in the event specific data. Valid values are:

0 - No Event
1 - Parameter Change Event
2 - System Event
4 - User Event

Parameter Change Event Logs any time a user makes a change to any TLP. The event data has the following format:

Description:	Operator ID			TLP			Data Type	New Value				Old Value				Spare	
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Operator ID**: Identifies who made the change.

- **TLP**: Identifies what parameter was changed.
- **Data Type**: Identifies the type of data stored in the new value and old value fields. Valid values are:

  0 - BIN
  1 - INT8
  2 - INT16
  3 - INT32
  4 - UINT8
  5 - UINT16
  6 - UINT32
  7 - FL
  8 - TLP
  9 - AC (3 bytes)
  10 - AC (7 bytes)
  11 - AC (10 bytes)
  12 - AC (12 bytes)
  13 - AC (20 bytes)
  14 - AC (30 bytes)
  15 - AC (40 bytes)
  16 – DOUBLE
  17 - TIME

- **New Value**: New value of the changed parameter. If the data size is larger than 4 bytes, the new value extends beyond its four-byte field and into the old value and spare fields.
- **Old Value**: Old value of the changed parameter. The old value always starts at byte offset 16. If the data type is too large to store both old value and new value, only the new value is stored.

System Event

A system event is an event the DL8000 logs internally. The event data has the following format:

Description:	Code	Description															
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Code**: More specifically defines the type of event that occurred. See Opcode 119 for list of event codes.
- **Description**: Textual description of the alarm.

User Event

An event a logged-in user causes. The data has the following format:

Description:	Operator Id			Code	Description												
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Operator ID**: Identifies who made the change.
- **Code**: More specifically defines the type of event that occurred. See Opcode 119 for list of event codes.
- **Description**: Textual description of the alarm.

Calibrate Verify Event

A calibrate verify event a logged-any time a user tests the calibration of an I/O point. The data has the following format:

Description:	Operator ID			TLP			Raw Value				Calibrated Value				Spare		
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Operator ID**: Identifies who tested the calibration.
- **TLP**: Identified what parameter was tested.
- **Raw Value**: Value of input before calibration was applied. Data type is FLOAT.
- **Calibrated Value**: Value of input after calibration was applied, Data type is FLOAT.
- **Description**: Textual description of the alarm.

Timestamp

The timestamp for the alarm represents the time the alarm was logged. The timestamp is a TIME [UINT32] representing the number of seconds that have elapsed since 12:00 a.m. Jan. 1, 1970.

2.14 Opcode 118, Request Alarm Data

Opcode 118 requests alarm data from the DL8000's Alarm Log.

Version	Description
1.10	Introduced

Table 2–14. Opcode 118, Request Alarm Data

Opcode 118						
Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 118: Send Specified Number of Alarms Starting With Specified Alarm index.	6	1	# of alarms requested (max 10) *SEE NOTE BELOW	6	1	Number of alarms being sent
	7	2	Starting Alarm Log index	7	2	Starting Alarm Log index
				9	2	Current Alarm Log index
				11	23	Alarm Data
					.	(above repeated as necessary)

Note: If no alarms are requested, the DL8000 does not return alarm data.

Alarm Data The alarm log stores the last 450 alarm entries. Each alarm consists of 23 bytes and has the following general format:

Description	Type	Time				Alarm-specific Data																	
Byte:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

Alarm Type The alarm type (byte 0) is a packed one-byte field that also includes information identifying if the alarm indicates a set or clear condition, and if the alarm is an SRBX alarm.

Alarm Type Byte Breakdown The alarm type (byte 0) is a packed one-byte field that also includes information identifying if the alarm indicates a set or clear condition, and if the alarm is an SRBX alarm. It has the following format:

Description	SRBX	Condition	Type					
Bit:	7	6	5	4	3	2	1	0

- **SRBX (most significant bit)**: Indicates whether the alarm was an SRBX alarm. An SRBX allows the DL8000 to notify a host about certain alarm conditions. The host may be notified when an alarm is either set or cleared. Refer to *Chapter 6*. Valid values are:

0 - No SRBX
1 - SRBX issued

- **Condition (bit 6):** Indicates if the alarm is being set or cleared. Valid values are:

  0 - Cleared
  1 – Set

- **Type (bits 5-0)**: Identifies what type of alarm is stored. See Alarm-specific Data for byte usage (5-22) of each type. Valid values are:

  0 - No Alarm
  1 - Parameter Alarm
  2 - FST Alarm
  3 - User Text Alarm
  4 - User Value Alarm

Time Bytes 1 to 4 provide the timestamp for the alarm, which is the time the alarm was logged. The timestamp is a TIME [UINT32] which represents the number of seconds that have elapsed since 12:00 a.m. Jan. 1, 1970.

Alarm-specific Data For each alarm type, bytes 5 to 22 provide an alarm description and value as appropriate:

Parameter Alarm

This type of alarm is typically generated by a parameter reaching a particular value. The data for this particular alarm has the following format:

Description:	Code	TLP			Alarm Description										Value			
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

- **Code**: Reason why the alarm was logged. Some codes only hav meaning for certain TLPs. Valid values are:

  0 - Low Alarm
  1 - Low Low Alarm
  2 - High Alarm
  3 - High High Alarm
  4 - Rate Alarm
  5 - Status Change
  6 - Point Fail
  7 - Scanning Disabled
  8 - Scanning Manual
  9 - Redundant Total Counts
  10 - Redundant Flow Register
  11 - No Flow Alarm
  12 - Input Freeze Mode
  13 - Sensor Communication Failure
  14 - 485 Communication Failure
  15 - Off Scan Mode
  16 - Manual Flow Inputs.

17 - Meter Temperature Failure Alarm
18 - Compressibility Calculation Alarm
19 - Sequence Out of Order
20 - Phase Discrepancy
21 - Pulse Synchronization Failure
22 - Frequency Discrepancy
23 - Pulse Input One Failure
24 - Pulse Input Two Failure
25 - Pulse Output Buffer Overrun
26 - Pulse Output Buffer Warning
27 - Relay Fault
28 - Relay Failure

- **TLP**: Parameter that caused the alarm. In some situations only the Type and Logical of the TLP have meaning.
- **Alarm Description**: Short textual description of the alarm.
- **Value**: Value of the specified TLP when alarm was logged. Data is a floating-point value regardless of the type associated with the parameter for specified TLP.

FST Alarm Alarm that was logged from an FST. The data for this particular alarm has the following format:

Description:	FST #	Alarm Description												Value			
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

- FST # : Indicates which running FST logged the alarm.
- Alarm Description: Short textual description of the alarm
- Value: Floating point value associated with alarm.

User Text Alarm Alarm that was logged by a User C++ program. The data for this particular alarm has the following format:

Description:	Alarm Description																	
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

- Alarm Description: Short textual description of the alarm

User Value Alarm Alarm that was logged by a User C++ program. The data for this particular alarm has the following format:

Description:	Alarm Description													Value			
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

- Alarm Description: Short textual description of the alarm
- Value: Floating point value associated with alarm.

2.15 Opcode 119, Request Event Data

Opcode 119 requests event data from DL8000's Event Log. The Event Log consists of a maximum of 450 events. Each event consists of 22 bytes, organized according to one of the five formats described below.

Version	Description
1.10	Introduced

Table 2–15. Opcode 119, Request Event Data

Opcode 119						
Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data Offset	Data Length	Description of Data	Data Offset	Data Length	Description of Data
Opcode 119: Send Specified Number of Events Starting with the Specified Event Index	6	1	# of events requested (max 10) *SEE NOTE BELOW	6	1	Number of events being sent
	7	2	Starting Event Log index	7	2	Starting Event Log index
				9	2	Current Event Log index
				11	22	Event Data
					.	(above repeated as necessary)

Note: If no events are requested, the DL8000 does not return event data.

Event Data The event log stores the last 450 event entries. Each event consists of 22 bytes and has the following general format:

Description:	Type	Time				Event Specific Data																
Byte:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Event Type The event type identifies what type of event is stored in the event specific data. Valid values are:

0 - No Event
1 - Parameter Change Event
2 - System Event
3 - FST Event
4 - User Event
5 - Power Lost Event
6 - Clock Set Event
7 - Calibrate Verify Event

Parameter Change Event

A Parameter Change event is logged any time a user makes a change to any TLP. The data for the event has the following format::

Description:	Operator ID			TLP			Data Type	New Value				Old Value				Spare	
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Operator ID**: Identifies who made the change.
- **TLP**: Identifies what parameter was changed.
- **Data Type**: Identifies the type of data stored in the new value and old value fields. Valid values are:

  0 - BIN
  1 - INT8
  2 - INT16
  3 - INT32
  4 - UINT8
  5 - UINT16
  6 - UINT32
  7 - FL
  8 - TLP
  9 - AC (3 bytes)
  10 - AC (7 bytes)
  11 - AC (10 bytes)
  12 - AC (12 bytes)
  13 - AC (20 bytes)
  14 - AC (30 bytes)
  15 - AC (40 bytes)
  16 – DOUBLE
  17 - TIME

- **New Value**: New value of the changed parameter. New value will extend beyond its four byte field and into the old value and spare fields if the data size is larger than 4 bytes.
- **Old Value**: Old value of the changed parameter. The old value always starts at byte offset 16. If the data type is too large to store both old value and new value, only the new value will be stored.

System Event

A System event logs internally in the DL8000. The data for the event has the following format:

Description:	Code	Description															
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Code**: More specifically defines the type of event that occurred. Valid values are:

  144 - Initialization Sequence
  145 - All Power Removed
  146 - Initialize from defaults.
  147 - ROM CRC Error

148 - Database Initialization
150 - Program Flash
151 – Weights and Measures Switch Enabled
152 – Weights and Measures Switch Disabled
153 – Parameter access lookup failed
154 - Smart Module Inserted
155 - Smart Module Removed
200 - Clock Set
248 - Text Message
249 - Download Configuration
250 - Upload Configuration
251 - Calibration Timeout
252 - Calibration Cancel
253 - Calibration Success
254 - MVS Reset to Factory Defaults

- **Description**: Textual description of the alarm.

FST Event An FST event is logged by an FST. The data for the event has the following format:

Description:	FST #	Value				Description										Spare	
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **FST #**: Identifies which FST logged the event.
- **Value**: Floating point value associated with event.
- **Description**: Textual description of the event.

User Event A User event is logged by the action of a logged in user. The data for the event has the following format:

Description:	Operator Id			Code	Description												
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Operator ID**: Identifies who made the change.
- **Code**: More specifically defines the type of event that occurred. Valid values are:

144 - Initialization Sequence
145 - All Power Removed
146 - Initialize from defaults.
147 - ROM CRC Error
148 - Database Initialization
150 - Program Flash
151 – Weights and Measures Switch Enabled
152 – Weights and Measures Switch Disabled
153 – Parameter access lookup failed
154 - Smart Module Inserted
155 - Smart Module Removed
200 - Clock Set
248 - Text Message

249 - Download Configuration
250 - Upload Configuration
251 - Calibration Timeout
252 - Calibration Cancel
253 - Calibration Success
254 - MVS Reset to Factory Defaults

- **Description**: Textual description of the alarm.

Power Lost Event A Power Lost event is logged when power to the DL8000 has been lost. The data for the event has the following format:

Description:	Time				Not Used												
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Time**: Time that power to the unit was lost.

Clock Set Event A Clock Set event is logged when the time is set on the DL8000. The data for the event has the following format

Description:	Time				Not Used												
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Time**: Identifies the time on the DL8000 was set to.

Calibrate Verify Event A Calibrate Verify event is logged any time a user tests the calibration of an I/O point.

Description:	Operator ID			TLP			Raw Value				Calibrated Value				Spare		
Byte:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- **Operator ID**: Identifies who tested the calibration.
- **TLP**: Identifies what parameter was tested.
- **Raw Value**: Value of input before calibration was applied. Data type is float.
- Calibrated Value: Value of input after calibration was applied. Data type is float.

Timestamp The timestamp for the alarm represents the time the alarm was logged. The timestamp is a TIME [UINT32] which represents the number of seconds that have elapsed since 12:00 a.m. Jan. 1, 1970

2.16 Opcode 135, Request Single History Point Data

Opcode 135 requests a specified number of history data values for a single history point, starting at a specified history index.

Version	Description
1.10	Introduced

The history segment indicates where data is requested, according to the following format:

0 = General History #0
1 = General History #1
2 = General History #2
.
.
.
9 = General History #9
10 = General History #10

The history point can be referenced by point number only as zero (0) – x, where x is the number of history points defined for a History Segment. For each history segment, you can retrieve three types of possible history: Minute (0), Periodic (1), and Daily (2).

You can also retrieve the Periodic (3) and Daily (4) timestamps.

The starting history index specifies the record from which the history values start:

- Minute History: 0 – 60.
- Periodic History: 0 – (#periodic entries in history point – 1) (24 hours per day repeated for a maximum of 35 days).
- Daily History: 0 – (#daily entries in history point – 1).

Opcode 135 returns the history values for the requested history point from the starting history index and continues until it completes the requested number of indexes. To read timestamps, specify the value in “Type of History”.

The timestamp is a TIME [UINT32] representing the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970. This can be thought of as column addressing.

Table 2–16. Opcode 135, Request Single History Point Data

Opcode 135						
Communi-Cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
Opcode 135: Send Specified # of History Data for Specified History Point Starting at Specified History Index	6	1	History Segment (0-10)	6	1	History Segment (0-10)
	7	1	Point number (0-(# of history points for history segment – 1))	7	1	Point number (0-(# of history points for history segment – 1))
	8	1	Type of History (Minute – 0, Periodic – 1, or Daily – 2, Periodic Time Stamps – 3; Daily Time Stamps – 4)	8	2	Current history segment index
	9	2	Starting history segment index {Minute 0 – 59, Periodic 0 - (#periodic entries in history point – 1), or Daily 0 - (#daily entries in history point – 1)}	10	1	# of values being sent
	11	1	# of values requested (max 60) *SEE NOTE BELOW	11	4	1st history value
					.	(above repeat as necessary)

Note: If no events are requested, the DL8000 does not return history values.

2.17 Opcode 136, Request Mutiple History Point Data

Opcode 136 requests a specified number of history data values for a specified starting history index for a specified number of time periods, starting at a specified history point for a specified number of history points.

Version	Description
1.10	Introduced

The history segment indicates where data is requested. Following are the history segments:

0 = General History #0
1 = General History #1
2 = General History #2
.
.
.
9 = General History #9
10 = General History #10

The history index specifies the record to be used:

- Minute History: 0 – 60.
- Periodic History: 0 – (#periodic entries in history point – 1) (24 hours per day repeated for a maximum of 35 days).
- Daily History: 0 – (#daily entries in history point – 1).

There are three types of history possible to be retrieved from each history segment: Minute (0), Periodic (1), or Daily (2).

The starting history point can be referenced by point number only as 0 – x, where x is the number of history points defined for a History Segment.

Opcode 136 returns the history values for the requested history index from the starting history point and continuing until the requested number of history points is completed. The time stamp for the history index will always be returned.

The timestamp is a TIME [UINT32] representing the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970. This can be thought of as row addressing. An error is returned if the day was not found.

Table 2–17. Opcode 136, Request Multiple History Point Data

Opcode 136						
Communi-Cation Opcode	**Host Request to DL8000**			**DL8000 Response to Host**		
	Data			**Data**		
	Offset	**Length**	**Description of Data**	**Offset**	**Length**	**Description of Data**
Opcode 136: Send Specified # of History Data for Specified History Index Starting at Specified History Point	6	1	History Segment (0-10)	6	1	History Segment (0-10)
	7	2	History Segment Index {Minute 0 - 59, Periodic 0 - (#periodic entries in history point – 1), or Daily 0 - (#daily entries in history point – 1)}	7	2	History Segment Index {Minute 0 - 59, Periodic 0 - (#periodic entries in history point – 1), or Daily 0 - (#daily entries in history point – 1)}
	9	1	Type of History (Minute – 0, Periodic – 1, or Daily – 2)	9	2	Current history segment index
	10	1	Starting history point (0-(# of history points for history segment – 1))	11	1	# of data elements being sent ((# history points + 1) * # time periods) Value is 0 if the request is invalid.
	11	1	# of history points	12	4	Time stamp for 1st time period
	12	1	# of time periods *SEE NOTE BELOW	16	4	1st history point value
			((# history points + 1) * # time periods) must not be greater than 60		.	(repeat for number of history points)
					(above repeated for number of time periods)	

Note: If no time periods are requested, the DL8000 does not return history values.

2.18 Opcode 137, Request History Index for a Day

Opcode 137 requests the Periodic and Daily Index for a specific day of a specified history point. If a day is not found, an opcode error is returned.

Version	Description
1.10	Introduced

Table 2–18. Opcode 137, Request History Index for a Day

Opcode 137						
Communi-cation Opcode	**Host Request to DL8000**			**DL8000 Response to Host**		
	Data Offset	**Data Length**	**Description of Data**	**Data Offset**	**Data Length**	**Description of Data**
Opcode 137: Send History Index for Specified History Point for Specified Day and Month	6	1	History Segment (0 – 10)	6	1	History Segment (0 – 10)
	7	1	Day requested	7	2	Starting Periodic Index for day and month request.
	8	1	Month requested	9	2	# periodic entries for day
				11	2	Daily Index for day and month requested. Not valid if the number of daily entries for requested day is 0.
				13	2	# daily entries per contract day

2.19 Opcode 138, Request Daily and Periodic History for a Day

Opcode 138 requests the periodic and daily history for a given day. If a day is not found, the DL8000 returns an opcode error. An opcode error can also occur if there are more periodic and daily entries than can fit in a reply. Request history point 255 to retrieve timestamps for the specified day.

Version	Description
1.10	Introduced

Table 2–19. Opcode 138, Request Daily and Periodic History for a Day

Opcode 138						
Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 138: Send Periodic and Daily Index for Specified History Point for Specified Day and Month	6	1	History Segment (0 – 10)	6	1	History Segment (0 – 10)
	7	1	History point (0 – (# of history points for history segment – 1))	7	1	History point (0 – (# of history points for history segment – 1))
	8	1	Day requested	8	1	Day requested
	9	1	Month requested	9	1	Month requested
				10	2	# periodic entries
				12	2	# daily entries
				14	4	periodic value
						(above repeated for each periodic value)
					4	daily value
						(above repeated for each daily value)

2.20 Opcode 139, History Information Data

Opcode 139 requests various types of information from history. Depending on the command, you can retrieve the configured points, retrieve the data, or the timestamps.

Version	Description
1.10	Introduced

Table 2–20. Opcode 139, History Information Data

Opcode 139						
Communi-Cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
Opcode 139: History	6	1	Command	6	1	Command
Command = 0 Request configured points.	7	1	History Segment	7	1	History Segment
				8	1	Number of configured points
				9	1	First configured point.
					.	(above repeated as necessary)
Command = 1 Request specified point data	7	1	History Segment	7	1	History Segment
If Request Timestamps is 0, Number of points * Number of Time Periods must not be greater than 60.	8	2	History Segment Index {Minute 0 - 59, Periodic 0 - (#periodic entries in history point – 1), or Daily 0 - (#daily entries in history point – 1)}	8	2	Current Index
	10	1	Type of History (Minute – 0, Periodic – 1, or Daily – 2)	10	1	Number of time periods
	11	1	Number of time periods	11	1	Request Timestamps
If Request Timestamps is 1, (Number of points + 1)* Number of Time Periods must not be greater than 60.	12	1	Request Timestamps	12	1	Number of points
				13	4	Timestamp for first index (not returned if Request Timestamps parameter is 0)
	13	1	Number of points	17	4	1st history point value
	14	1	Requested history point	21	.	(repeat for number of history points
		.	(above repeated as necessary)		(Above repeated for number of time periods)	

2.21 Opcode 166, Set Single Point Parameters

Opcode 166 either configures a single point or configures a contiguous block of parameters for a single point. This opcode is more efficient than Opcode 181 when writing to the entire point, or even a contiguous portion of the point, is required.

Version	Description
1.10	Introduced

Table 2–23. Opcode 166, Set Single Point Parameters

Opcode 166						
Communication Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
Opcode 166: Set Specified Contiguous Block of Parameters	6	1	Point type			No data bytes.
	7	1	Point/Logic Number			Acknowledgment sent back.
	8	1	Number of Parameters			
	9	1	Starting parameter Number			
	10	1→230	Data (a contiguous block)			

2.22 Opcode 167, Request Single Point Parameters

Opcode 167 either reads the configuration of a single point or reads a contiguous block of parameters for a single point. Opcode 167 can be more efficient than reading the entire point, or even a contiguous portion of the point, using opcode 180.

Version	Description
1.10	Introduced

Table 2–24. Opcode 167, Request Single Point Parameters

Opcode 167						
Communication Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
Opcode 167: Send specified contiguous block of parameters	6	1	Point type	6	1	Point type
	7	1	Point/Logic Number	7	1	Point/Logic Number
	8	1	Number of Parameters	8	1	Number of Parameters
	9	1	Starting parameter Number	9	1	Starting parameter Number
				10	1→230	Data (a contiguous block)

2.23 Opcode 180, Request Parameters

Opcode 180 reads several parameters in a single request. The parameters can be from different points and of different point types. The opcode is intended to read any combination of parameters listed in this document.

Version	Description
1.10	Introduced

Errors The opcode responds with an error response if:

- The response is longer than 240 bytes
- If the request is for an invalid parameter, possibly due to a point that is not configured.

Table 2–25. Opcode 180, Request Parameters

Opcode 180						
Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
Opcode 180: Send Specified Parameters	6	1	Number of parameters requested	6	1	Number of parameters requested
	7	1	Point type	7	1	Point type
		1	Point/Logic number		1	Point/Logic number
		1	Parameter number		1	Parameter number
		.	(above repeated as necessary)		x	Data comprising the parameter
					.	(above repeated as necessary)

2.24 Opcode 181, Write Parameters

Opcode 180 writes several parameters with a single request. The parameters can be from different points and of different point types. The opcode is intended to write any combination of parameters listed in this document.

Version	Description
1.10	Introduced

Errors The opcode responds with an error response if:

- The response is longer than 240 bytes.
- The request is for an invalid parameter.
- A parameter's data is out of range.
- A parameter is read-only.

Table 2–26. Opcode 181, Write Parameters

Opcode 181						
Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data Offset	Data Length	Description of Data	Data Offset	Data Length	Description of Data
Opcode 181: Set Specified Parameters	6	1	Number of parameters requested			No data bytes.
	7	1	Point type			Acknowledgment sent back.
		1	Point/Logic number			
		1	Parameter number			
		x	Data comprising the parameter			
		.	(above repeated as necessary)			

2.25 Opcode 203, General File Transfer

Opcode 203 transfers files to and from the flash file system.

Version	Description
1.10	Introduced (as Commands 1 through 5)

Paths /flash/userData (recommended for user C applications)

Opcode 255 Error Codes

Invalid file	FILE_DOES_NOT_EXIST	67
Flash file system full	FLASH_FILE_SYSTEM_FULL	69
Invalid path	INVALID_PATH	72
Invalid offset	INVALID_OFFSET	73
Invalid option	INVALID_OPTION	74
More than 10 files open	TOO_MANY_FILES_OPEN	75

Other Limitations/ Special Cases

- Maximum of 10 open files.
- Can create only one directory per open command. That is, if . /flash/etc does not exist, you cannot open a file in /flash/etc/bin
- You would be able to open a file in /flash/etc, which would create the etc directory.
- You can delete both directories and files with the delete command.

Table 2–30. Opcode 203, General File Transfer

Opcode 203						
	Host Request to DL8000			**DL8000 Response to Host**		
	Data			**Data**		
Command	**Offset**	**Length**	**Description of Data**	**Offset**	**Length**	**Description of Data**
Open (An open must be performed first before reading or writing to any file) When creating a new file the path must start with /flash/.	6 7 8 108	1 1 100 25	Command (1) Options 0 = Open file for reading 1 = Open file for writing 2 = Create new file for writing (if doesn't exist) 3 = Open file for update (reading and writing) 4 = Truncate to zero length or create file for writing Path File Name (25 byte filename must include null character)	6 7	1 4	Command (1) File Descriptor
Read (Must use File Descriptor returned by the open command)	6 7 11	1 4 4	Command (2) File Descriptor Offset	6 7 11 15 19 20	1 4 4 4 1 Num-ber of bytes	Command (2) File Descriptor File Size Offset Number of bytes Data (maximum 230 bytes) (above repeated as necessary)
Write (Must use File Descriptor returned by the open command)	6 7 11 15 19 20	1 4 4 4 1 Numbe r of bytes	Command (3) File Descriptor File Size Offset Number of bytes Data (maximum 230 bytes) (above repeated as necessary)	6 7 11	1 4 4	Command (3) File Descriptor Offset
Close (Closes opened file and removes descriptor)	6 7	1 4	Command (4) File Descriptor	6	1	Command (4)
Delete (Does not require file descriptor) Can delete file or directory within "/flash"	6	1	Command (5)	6	1	Command (5)
Read Directory Contents (Version 2.10 or prior) Returns all filenames in the "./flash/data" directory including subdirectories	6 7	1 100	Command (6) Path	6	1	Command (6) Additional filenames to read: 0 = No 1 = Yes

2.26 Opcode 224, SRBX Signal

Opcode 224 represents the message that is sent to the host to signal an SRBX. Refer to *Chapter 6* for an example of spontaneous report-by-exception.

Version	Description
1.10	Introduced

Table 2–31. Opcode 224, SRBX Signal

Opcode 224						
Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
Opcode 224: Signal Report- by-Exception			Host could possibly use a variety of different ways to retrieve the alarm index.			No data bytes.

2.27 Opcode 225, Acknowledge SRBX

Opcode 225 acknowledges receipt of an SRBX alarm message. Refer to *Chapter 6* for an example of spontaneous report-by-exception.

Version	Description
1.10	Introduced

Table 2–32. Opcode 225, Acknowledge SRBX

Opcode 225						
Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data			Data		
	Offset	Length	Description of Data	Offset	Length	Description of Data
Opcode 225: Acknowledge Report-by-Exception	6	2	Current Alarm Log index			No data bytes. Acknowledgment sent back. DL8000 clears SRBX status if the DL8000’s alarm index equals data received from the host.

2.28 Opcode 255, Error Indicator

Opcode 255 is an error message indicator. If an opcode request is invalid, a request contains invalid data, or a value parmeter is out of range, the response is opcode 255.

Version	Description
1.10	Introduced

This special opcode's data consists of an error code byte and an offset byte, as shown below:

Error Code	Description	Byte that caused error
1	Invalid Opcode request.	Opcode
2	Invalid parameter number.	Parameter number
3	Invalid logical number.	Logical number
4	Invalid point type.	Point type
5	Received too many data bytes.	Length
6	Received too few data bytes.	Length
12	Obsolete (Reserved, but not used)	
13	Outside valid address range.	Address
14	Invalid history request.	History point number
16	Invalid event entry.	Event code
17	Requested too many alarms.	Number of alarms requested
18	Requested too many events.	Number of events requested
19	Write to read only parameter. Exception for Opcode 166 which can have multiple parameters. Some of these may be RO, and some may not.	Parameter number
20	Security error.	Opcode
21	Invalid security logon.	Login ID or Password
22	Invalid store and forward path.	Any address or group
24	History configuration in progress.	Opcode
25	Invalid parameter range	Parameter
29	Invalid 1 day history index request.	History Segment, point, day or month
30	Invalid history point.	History Point
31	Invalid Min/Max request.	History segment or point number
32	Invalid TLP.	Point type, parameter, or logical number
33	Invalid time.	Seconds, minutes, hours, days, months, or years

The offset is the byte offset into the message in which an error was detected. Multiple parameters may cause an error, so there may be multiple error codes in the opcode 255 response. This enables the separation of good data from bad. A multiple set could have some errors returned as well as some data being set. *Table 2-34, Valid Error Codes for a Given Opcode*, contains all of the error codes and the opcodes that may cause them.

Table 2–33. Opcode 255, Request Multiple History Point Data

Opcode 255						
Communi-Cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 255: Invalid Parameters in Request Received by DL8000			Reserved for DL8000 use.	⎡6 ⎣7	1 1 .	Error code (see Opcode 200) Offset of the byte that caused the error. (above repeated as necessary). With the exceptions shown in the Note below:

Note: The following are special cases for the value returned in offset 7:

- For opcodes 166 and 167:
  Returns the requested point type's Actual parameter. For example, if you request parameters 5 through 10 and 6 fails, the value of parameter 6 (not 2) is returned in offset 7.
- For opcodes 180 and 181:
  Returns the TLP-Tuple offset. For example, if you request ten TLPs and the 9th TLP has an error, 9 values are returned.

Table 2–34. Valid Error Code for a Given Opcode

This chart shows the ROC Plus Protocol relationship between opcodes and the point types that they reference.

Error Codes

		Request current DL8000 configuration	Read data and time	Set real time clock	Read configurable opcode point data	Write configurable opcode point data	Set operator id code	Set store and forward action	Request I/O Point Position	Request today and yesterday min and max values	Request history tag and periodic index	Request alarm data	Request event data	Request history point data	Request history index data	Request history index for a day	Set single point parameters	Request single point parameters	Request parameters	Write parameters	RBX send to host	RBX Ack from host	Error indicator
Description	**#**	**6**	**7**	**8**	**10**	**11**	**17**	**24**	**50**	**105**	**108**	**118**	**119**	**135**	**136**	**137**	**166**	**167**	**180**	**181**	**224**	**225**	**255**
Invalid opcode request	**1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Invalid parameter number	**2**																				NA		NA
Invalid logical number	**3**																x	x	x	x	NA		NA
Invalid point type	**4**																				NA		NA
Received too many data bytes	**5**	x	x	x	x	x	x	x	x	x	x	x	x	x	x	X	x	x	x	x	NA		NA
Received too few data bytes	**6**			x	x	x	x	x	x		x	x	x	X	x	X	x	x	x	x	NA	x	NA
Outside valid address range	**13**																				NA		NA
Invalid history request	**14**													x	x						NA		NA
Invalid FST request	**15**																				NA		NA
Invalid event entry	**16**																				NA		NA
Requested too many alarms	**17**											X									NA		NA
Requested too many events	**18**												X								NA		NA
Write to read only parameter	**19**																x*			x	NA		NA
Security error	**20**						x														NA		NA
Invalid security logon	**21**						x														NA		NA
Invalid store and forward path	**22**							x													NA		NA
Flash programming error	**23**																				NA		NA
History configuration in progress	**24**									x	x			x	x	x					NA		NA
Invalid parameter range	**25**			x		x											x			x	NA		NA

This chart shows the ROC Plus Protocol relationship between opcodes and the point types that they reference.

		Request current DL8000 configuration	Read data and time	Set real time clock	Read configurable opcode point data	Write configurable opcode point data	Set operator id code	Set store and forward action	Request I/O Point Position	Request today and yesterday min and max values	Request history tag and periodic index	Request alarm data	Request event data	Request history point data	Request history index data	Request history index for a day	Set single point parameters	Request single point parameters	Request parameters	Write parameters	RBX send to host	RBX Ack from host	Error indicator
Description	**#**	**6**	**7**	**8**	**10**	**11**	**17**	**24**	**50**	**105**	**108**	**118**	**119**	**135**	**136**	**137**	**166**	**167**	**180**	**181**	**224**	**225**	**255**
Invalid User C++ program number	**26**																				NA		NA
No room for User C++ program	**27**																				NA		NA
Out of sequence User C++ packet number	**28**																				NA		NA
Invalid 1 day history index request	**29**															x					NA		NA
Invalid history point	**30**										x										NA		NA
Invalid Min/Max request	**31**									x											NA		NA
Invalid TLP	**32**																x	x	x	x	NA		NA
Invalid time.	**33**			x																	NA		NA
Illegal Modbus range	**34**																x			x	NA		NA

* = Exception, for opcode 166 which can have multiple parameters. Some of these may be RO or Invalid State, and some may not.

Chapter 3 – Parameter Lists for Point Types

Configuring the DL8000 requires you to be familiar with the structure of the database. The database is broken into individual parameters and each database parameter is uniquely associated by parameter number and point type.

This section details ROC point types, Data Types, and User Defined Point (UDP) Types.

3.1 Type, Location/Logical, and Parameter (TLPs)

You reference data in the DL8000 by **t**ype, **l**ocation or **l**ogical, and **p**arameter (TLP). *Type* refers to the number of the point type. The *location* or *logical number* is a value based on physical input or output. A *parameter* is a numeric value assigned to each piece of data contained in a given point type. The tables in this section list the parameters numbers and descriptions for each of the point types.

3.2 Logical/Location Details

Within a point type, you reference individual points by either a location or a logical number (the “L” in the TLP referencing scheme). The Preset protocol uses *location* (which is based on a physical input or output [I/O] “module and point” location) for point types 101 through 109. All other point types use a *logical* number and are simply numbered in sequence.

- **Location (Physical Point Numbers 1 – 160)**: For point types 101 through 109, use the following location numbers for the field I/O and for diagnostic inputs:
  - Location Numbers **0** to **15** are assigned to the system I/O. For example, the five diagnostic points in a DL8000 would be 0 through 4.
  - Location Numbers **16** to **160** are assigned to field I/O. For example, an I/O module in slot 1 with 4 I/O points would be assigned as points 16 through 19.
- **Logical (Point Numbers 0 – 127)**: For all other point types (**other** than 101 through 109), the logical number is **0** to ***x***, where ***x*** is one less than the total number of points that exist for that point type. For example, the 16 PIDs would be logical numbers 0 through 15.

Table 3-1 details data types.

Table 3–1. Data Type

Data Type	Definition	# of Bytes	Default Range
BIN	Binary	1	0 →1 For each Bit
AC	ASCII character groups	1 per character	0x20 → 0x7E for each character
INT8	Signed Integer – 8 bits	1	-128 → 127
INT16	Signed Integer – 16 bits	2	-32,768 → 32,767
INT32	Signed Integer – 32 bits	4	-2,147,483,648 → 2,147,483,647
UINT8	Unsigned Integer – 8 bits	1	0 → 255
UINT16	Unsigned Integer – 16 bits	2	0 → 65,535
UINT32	Unsigned Integer – 32 bits	4	0 → 4,294,967,295
FL	Single Precision Floating Point – IEEE Format	4	Any valid IEEE double precision float (see Chapter 5)
DBL	Double Precision Floating Point – IEEE Format	8	Any valid IEEE double precision float (see Chapter 5)
TLP	Type, Point or Logical Number, Parameter Number	3	{0 → 255, 0 → 255, 0 →2 55}
TIME	Arithmetic Time: Number of seconds since Jan 1 1970 @ 00:00:00. This is a UINT32.	4	0 → 0 → 4,294,967,296 Jan 1, 1970 00:00:00 → Feb. 7, 2106 06:28:15

3.3 Binary Field (BIN) Example

This section provides an example alarm code from an analog input point type to demonstrate how a binary parameter is returned. A **1** in any bit indicates that bit is active or enabled.

	Scanning Disabled Alarm	Point Fail Alarm	Not Used	Rate Alarm	High High Alarm	High Alarm	Low Low Alarm	Low Alarm
Bit	7	6	5	4	3	2	1	0
Response Code	1	0	0	0	0	0	0	0

3.4 Point Type Table Fields

Each point type table is prefaced by a short description, a statement of the number of logical points (or iterations) of the point type, and the storage location for point type information. Point type tables contain the following information:

Field	Description
Param#	Defines the specific parameter number associated with that point type.
Name	Provides the name of the parameter.
Access	Indicates if the parameter can be read from and written to (**R/W**) or if the parameter is read-only (**R/O**).
System or User Update	Identifies who has write access to the data.
Data Type	Identifies the type of data being stored. Data types are defined in Chapter 2.
Length	Indicates the number of bytes the parameter uses.
Range	Identifies the range of accepted values for the parameter.
Default	Indicates the initial value of the parameter.
Ver	Identifies the version of program in which the parameter was first introduced.
Description	Provides a brief description of the parameter.

3.4.1 Point Type 60: Print Parameters

Description: Point type 60 provides print parameters.

Number of Logical Points: One logical point for each parameter may exist.

Storage Location: Point type 60 is saved to internal configuration memory.

Table 3-2: Point Type 60, Print Parameters

Point Type 60: Print Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Display tag	R/W	User	String20	20	0x20 → 0x7E for each ASCII character	“Reporting”	2.00	Provides identification for specific printer. Values must be printable ASCII characters.
1	Printer IP Address	R/W	User	String20	20	0x30 → 0x39 or 0x2E for each ASCII character, to make 4 groups of numbers separated by a period (.).	“ “	2.00	Sets a standard IPv4 address (such as 155.177.78.160). If you enter an invalid IPv4 address, the system sets the error TLP and disables printing. Additional characters after the address are ignored. **Note**: Used **only** if Printer type (60,0,23) is Ethernet.
2	Printer Port	R/W	User	UINT16	2	0 → 65,535	9100	2.00	Sets the port that the printer listens on for incoming print jobs. Most printers use port 9100, although 515, and 631 are also common. **Note**: Used **only** if Printer Type (60,0,23) is Ethernet.
3	RESERVED							1.00	Reserved for future use.
4	RESERVED							1.00	Reserved for future use.

Point Type 60: Print Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Output Device	R/O	System	UINT8	1	0 → 1	1	2.02	Sets the output device to which the system sends print output. Valid values are: 0 = Do nothing 1 = Send report to printer 2 = Send report to flash drive 3 = Send report to both printer and flash drive **Note**: To enable printing configure this parameter to Printer. Output to flash is presently not supported, so you cannot set the values 2 or 3 for this parameter.
6	Target Display File Name	R/O	System	String40	40	0x20 → 0x7E for each ASCII character	" "	2.00	Provides the filename associated with the display to be printed. The system sets this value when you select Target Display to Print (60,0,7).
7	Target Display to Print	R/W_CDNL	User	UINT8	1	0 → 255	7	2.00	Selects the display to be printed. These can be found in the Display Administrator, under "User Display" in ROCLINK 800. Initially the display to be printed defaults to **7**, which is the embedded .tar file. You can change this value by downloading another display in any available location on the display administrator.
8	Target Logical	R/W	User	UINT8	1	0 → 255	0	2.00	Selects which logical to print. If a display is tied to a point type, the system uses this configured value rather than all logical number for all text boxes associated with those point types.
9	Characters Per Inch	R/W	User	UINT8	1	4,6,8,10,12,14,16	12	2.00	Sets the number of characters that print per inch on the printer. This effectively is an inverse font size setting. Use it to fit large displays onto the printable area. **Note**: Used **only** if Printer Type (60,0,23) is Ethernet.

Point Type 60: Print Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
10	Print Error	R/W	User/ System	UINT16	2	As per bits described below	0	2.00	Specifies errors that could impede the application. If set, printing is disabled and a text message appears on the display. Clear an error either by resolving the cause of the error or clicking the Clear Error button on the user program display.
10.0	Bad IP Address			Bit 0				2.00	Occurs whenever the user enters an invalid IP address (for example, text or attempting to use hex).
10.1	Bad Port Number			Bit 1				2.00	Occurs if no RS-232 or RS-485 module is installed on the selected serial port. **Note**: Used **only** if Printer Type (60,0,23) is serial.
10.2	Inet Error			Bit 2				2.00	Occurs when IP address not in proper format. **Note**: Used **only** if Printer Type (60,0,23) is Ethernet.
10.3	Cannot Acquire Socket Handle			Bit 3				2.00	Occurs when system cannot acquire a socket. **Note**: Used **only** if Printer Type (60,0,23) is Ethernet.
10.4	Cannot Connect			Bit 4				2.00	Occurs when system cannot connect to printer or if a timeout has occurred. Applies to both Ethernet and serial connections. **Note**: For serial printing, if the user program is not able to acquire the port then this error occurs, since the port may be in use by some other application.
10.5	Sending Error			Bit 5				2.00	Occurs due to an error sending. Applies to both Ethernet and serial connections.
10.6	Display Not Found			Bit 6				2.00	Occurs if the specified display file does not exist.
10.7	Cannot Allocate Memory			Bit 7				2.00	Occurs when the system cannot allocate dynamic (heap) memory.
10.8	RESERVED			Bit 8				2.00	Reserved for future use
10.9	RESERVED			Bit 9				2.00	Reserved for future use

Point Type 60: Print Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
10.10	RESERVED			Bit 10				2.00	Reserved for future use
10.11	Bad Output Device			Bit 11				2.00	Occurs when the Output Device (60,0,5) configuration parameter does not have a correct value.
10.12	Bad Configuration			Bit 12				2.00	Occurs if any configuration is corrupt. This flag can not be reset manually; it automatically resets until no corrupt configuration parameters exist.
10.13	Comm. port config error			Bit 13				2.20	Occurs when you select Printer Type as Serial and do not select a serial port for data logging/printing.
10.14	RESERVED								Reserved for future use
10.15	RESERVED								Reserved for future use
11	RESERVED							2.00	Reserved for future use
12	Print Orientation	R/W	User	UINT8	1	0 → 1	0	2.00	Sets the page orientation of the Ethernet printer output. Valid values are: 0 = Portrait 1 = Landscape **Note**: Occurs **only** if Printer Type (60,x,23) is **Ethernet**.
13	RESERVED							2.00	Reserved for future use
14	RESERVED							2.00	Reserved for future use
15	RESERVED							2.00	Reserved for future use
16	RESERVED							2.00	Reserved for future use
17	RESERVED							2.00	Reserved for future use
18	RESERVED							2.00	Reserved for future use
19	RESERVED							2.00	Reserved for future use
20	RESERVED							2.00	Reserved for future use
21	RESERVED							2.00	Reserved for future use
22	RESERVED							2.00	Reserved for future use

Point Type 60: Print Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
23	Printer Type	R/O	System	UINT8	1	0 → 1	1	2.00	Sets the port type based on printer type. Valid values are: 0 = Ethernet printer 1 = Serial printer **Note**: If the Batching user program is active, **do no**t set this parameter directly. Instead, allow point type 63 to configure this setting.
23	Printer Type	RW_ CDNL	User	UINT8	1	0 → 1	1	2.20	Selects printer type. Valid values are: 0 = Ethernet printer 1 = Serial printer
24	Serial Port	R/O	System	UINT8	1	2 → 5	2	2.00	Sets the serial port the system uses for printing if Printer Type (TLP 60,0,23) is Serial. **Note**: If the Batching user program is active, **do not** set this parameter directly. Instead, allow point type 63 to configure this setting. In this case, this indicates the first comm port configured for data logging.
25	OIML Print Error	R/O	System	UINT16	2	As per bits used below	0	2.20	Each bit (25.0 through 25.15) indicates a specific type of error. These errors occur only when you have configured the legal record as either **Printout** or **History** and the request for the latest transaction fails. If the legal record is **Printout**, the Primary Print Error bit sets along with other errors and raises the Print Error Alarm with Primary severity; this prevents the authorization of a new transaction. If the legal record is **History**, the Secondary Print Error set with other errors and raises the Print Error Alarm with Info severity. A Secondary type error resets on authorization of the next transaction.
25.0	RESERVED						0		Reserved for future use

Point Type 60: Print Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
25.1	Printer Not Available						0	2.20	Printer is not ready or is not available. Printing aborts for this error. **Note**: Only for serial printing.
25.2	No Data Archived						0	2.20	No data to print as archiving has failed.
25.3	Print Timeout						0	2.20	Printing has not completed in specified time.
25.4	Primary Print Error						0	2.20	Print error has occurred and the print record is legal and the original copy has not yet printed.
25.5	Secondary Print Error						0	2.20	Sets when any print error condition raised along with any of following condition: 1 = Print out is legal and original copy is already printed. 2 = History is legal record
25.6	Print aborted						0	2.20	Printing aborted because line was not available for 300 seconds. **Note**: Applicable only to serial printing.
25.7	Cannot Open Serial Port						0	2.20	Serial port has not opened and print request fails for original transaction ticket.
25.8	Dynamic memory allocation fail						0	2.20	Sets when required dynamic memory allocation fails and print request fails for original transaction ticket.
25.9	CRC Fail Error						0	2.20	CRC fails for a given transaction ticket request. The CRC failure can be for a given transaction or for any batch of a given transaction.
25.10	Misc. Print Error						0	2.20	Printing has failed due to any internal error noted in parameter 10 (60,0,10).
25.11	RESERVED						0		Reserved for future use
25.12	RESERVED						0		Reserved for future use
25.13	RESERVED						0		Reserved for future use
25.14	RESERVED						0		Reserved for future use
25.15	RESERVED						0		Reserved for future use

Point Type 60: Print Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
26	Failed Transaction Number	R/O	System	UINT16	2	0 → 10000	10000	2.20	Indicates the number of the transaction for which a printout has failed. This number resets to a new value when any print error occurs, and resets to 10000 when an OIML print error resets.
27	Expected Transaction Print	R/O	System	UINT16	2	0 → 10000	10000	2.20	Indicates the number of the transaction for which the print ticket is expected. The Printer program sets this number when a new transaction starts, and resets the value to 10000 either when a ticket successfully prints for this transaction or when a print error occurs.
28	Printer Status	R/O	System	UINT8	1	0 → 1	1	2.20	Indicates printer availability Valid values are: 0 = Printer available. 1 = Printer not available. **Note**: This parameter also keeps the DL8000 synchronized with the printer. After powering up the DL8000, restart the printer to synchronize printer with DL8000.
29	Flow Control Method	RW	User	UINT8	1	0 → 255	0	2.23	Defines the printer flow control TLP that enables you to set flow control. Valid values are **0** (none) or **1** (XON/XOFF) if the legal records is not set to printout.
30	Disable Predefined Strings on Print	R/W CNDL	User	UINT8	1	0 → 4	0	2.30	Excludes predefined strings to be printed. Valid values are: 0 = No; do not exclude predefined strings 1 = Yes; exclude predefined strings. **Note**: You can only configure this parameter through ROCLINK 800. It is not available through the keypad display.

3.4.2 Point Type 61: Transaction History Parameters

Description: Point type 61 provides transaction history parameters.

Number of Logical Points: 1 logical point for each parameter.

Storage Location: Point type 61 is saved to internal configuration memory.

Table 3-3: Point Type 61, Transaction History Parameters

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	String20	20	ASCII String	"Trans History"	1.00	Provides a 20-character description of the channel.
1	RESERVED								Reserved for future use
2	RESERVED								Reserved for future use
3	RX Batch Number	R/W	TA/ System	UINT16	2	$0 \rightarrow 9999$	10000	1.00	Defines the batch number whose data needs to be retrieved form history and populated to the below point type with batch data. The configured parameters related to batch, only those will be populated. After all are populated this parameter value will reset to 10000.
4	RX Trans Number	R/W	TA/ System	UINT16	2	$0 \rightarrow 9999$	10000	1.00	Defines the transaction number whose data needs to be retrieved form history and populated to the below point type with Transaction data. The configured parameters related to Transaction, only those will be populated. After all are populated this parameter value will reset to 10000.
5	S Base Temp Option	R/O	System	UINT8	1	$0 \rightarrow 1$	1	1.22	Defines whether the history user program should archive the Base Temp Option at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store 1 = Store at the end of batch

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6	S FWA Pressure	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether Avg batch pressure (FWA) [TLP ID: 2141] should be archived by history user program at the end of batch (when the Store Batch command is received).Valid values are: 0 = Idle State, do not store 1 = Store at the end of batch
7	S FWA Base Density	R/O	System	UINT8	1	0 → 1	1	1.22	Defines whether the history user program should archive the Avg batch base density (FWA) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store 1 = Store at the end of batch
8	S FWA Temp	R/O	System	UINT8	1	0 → 1	1	1.22	Defines whether the history user program should archive the Avg batch temp (FWA) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch
9	S Preset Qty	R/W	User	UINT8	1	0 →1	0	1.00	Defines whether the history user program should archive Preset Read Qty at the end of batch (when the Store Batch command is received). Valid values are: 0 =- Idle State, do not store. 1 = Store at the end of batch
10	S Gross Qty	R/O	System	UINT8	1	0 →1	0	1.22	Defines whether the history user program should archive Gross Del Qty(Batch) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 =Store at the end of batch
11	S Std Qty	R/O	System	UINT8	1	0 → 1	1	1.22	Defines whether the history user program should archive Net Std Del Qty (Batch) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	S Mass	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program should archive Mass Del Qty (Batch) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch
13	S Comp Gross Qty	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program should archive Gross Component Del Qty (Batch) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch
14	S Comp Std Qty	R/W	User	UINT8	1	0 → 1	0	1.00	This defines whether the history user program should archive Net Std Component Del Qty (Batch) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch.
15	S Comp Mass Qty	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program should archive Mass Component Del Qty (Batch) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch
16	S Comp Temp	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program should archive Avg component temp (FWA) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch
17	S Comp 1 Req Per	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program should archive Percentage of Component 1 at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
18	S Comp Batch Per	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program should archive Actual component % at the end of batch (when the Store Batch command is received) Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch
19	S Add Gross Qty	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program should archive Additive batch totalizer at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch
20	S Operating Mode	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program should archive Operating mode at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch
21	S Unit Address	R/O	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives System Variable (TLP 91,0,0) at the end of transaction, i.e when Store Transaction command[1] is received. 0 = Idle State, do not store 1 = Store at the end of transaction
22	S Recipe Num	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives New Recipe Selection at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction
23	S Data Item 1	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives Data item 1 at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
24	S Data Item 2	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	Defines whether the history user program archives Data item 2 at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction
25	S Data Item 3	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	Defines whether the history user program archives Data item 3 at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction
26	S Data Item 4	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	Defines whether the history user program archives Data item 4 at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 =Store at the end of transaction
27	S Data Item 5	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	Defines whether the history user program archives Data item 5 at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction
28	S Start Date Time	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	Defines whether the history user program archives Transaction Start date and time at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction
29	S End Date Time	R/W	User	UINT8	1	$0 \rightarrow 1$	1	1.00	Defines whether the history user program archives Transaction End date time at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
29	S End Date Time	R/O	System	UINT8	1	0 → 1	1	2.20	Defines whether the history user program archives Transaction End date time at the end of transaction. Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction
30	S Trans Gross Qty	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives Gross Del Qty (Transaction) at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction
31	S Trans Std Qty	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives Net Std Del Qty (Transaction) (63,x,142) at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction
32	S Trans Mass Qty	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives Mass Del Qty (Transaction) at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction
33	S Trans Start Gross	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives Transaction Start Gross Reading at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction
34	S Trans Start Std	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives Transaction Start Net Std Reading at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
35	S Trans Start Mass	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives Transaction Start Mass Reading at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction
36	S Trans End Gross	R/W	User	UNIT8	1	0 → 1	0	1.00	Defines whether the history user program archives Transaction End Gross Reading at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction
37	S Trans End Std	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives Transaction End Net Std Reading at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction
38	S Trans End Mass	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives Transaction End Mass Reading at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction
39	S Trans Add Gross	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives additive transaction totalizer at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
40	Batch Number	R/O	System	UINT16	2	0 → 9999	10000	1.00	Indicates the batch number populated by History user program after the RX Batch number command is received, if user-specified batch is present in history record. Otherwise this value is **10000**, indicating an invalid batch number, not present in history.
41	Transaction Number	R/O	System	UINT16	2	0 → 9999	10000	1.00	Displays the Transaction number after the receipt of the RX Trans Number command. If the specified transaction number is present in the history record then that number is displayed. Otherwise this value is **10000**, indicating an invalid transaction number, not present in history.
42	FWA Temp	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.00	Defines FWA temperature data. The History user program populates this field only if you set the configuration parameter (61,0,8).
43	Preset Qty	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines Preset Qty data. The History user program populates this field only if you set the configuration parameter (61,0,9).
44	Gross Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,10).
45	Std Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Std Qty data. The History user program populates this field only if you set the configuration parameter (61,0,11).
46	Mass	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Weight data. The History user program populates this field only if you set the configuration parameter (61,0,12).
47	Comp 1 Gross Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Comp 1 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,13).

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
48	Comp 2 Gross Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Comp 2 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,13).
49	Comp 3 Gross Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Comp 3 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,13).
50	Comp 4 Gross Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Comp 4 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,13).
51	Comp 1 Std Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Comp 1 Std Qty data. The History user program populates this field only if you set the configuration parameter (61,0,14).
52	Comp 2 Std Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Comp 2 Std Qty data. The History user program populates this field only if you set the configuration parameter (61,0,14).
53	Comp 3 Std Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Comp 3 Std Qty data. The History user program populates this field only if you set the configuration parameter (61,0,14).
54	Comp 4 Std Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Comp 4 Std Qty data. The History user program populates this field only if you set the configuration parameter (61,0,14).
55	Comp 1 Mass Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Comp 1 Weight Qty data. The History user program populates this field only if you set the configuration parameter (61,0,15).
56	Comp 2 Mass Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Comp 2 Weight Qty data. The History user program populates this field only if you set the configuration parameter (61,0,15).
57	Comp 3 Mass Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Comp 3 Weight Qty data. The History user program populates this field only if you set the configuration parameter (61,0,15).

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
58	Comp 4 Mass Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Comp 4 Weight Qty data. The History user program populates this field only if you set the configuration parameter (61,0,15).
59	Comp 1 Temp	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.00	Defines Comp 1 Temp data. The History user program populates this field only if you set the configuration parameter (61,0,16).
60	Comp 2 Temp	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.00	Defines Comp 2 Temp data. The History user program populates this field only if you set the configuration parameter (61,0,16).
61	Comp 3 Temp	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.00	Defines Comp 3 Temp data. The History user program populates this field only if you set the configuration parameter (61,0,16).
62	Comp 4 Temp	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.00	Defines Comp 4 Temp data. The History user program populates this field only if you set the configuration parameter (61,0,16).
63	Comp 1 Req Per	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines Comp 1 Req % data. The History user program populates this field only if you set the configuration parameter (61,0,17).
64	Comp 2 Req Per	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines Comp 2 Req % data. The History user program populates this field only if you set the configuration parameter (61,0,17).
65	Comp 3 Req Per	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines Comp 3 Req % data. The History user program populates this field only if you set the configuration parameter (61,0,17).
66	Comp 4 Req Per	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines Comp 4 Req % data. The History user program populates this field only if you set the configuration parameter (61,0,17).
67	Comp 1 Batch Per	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines Comp 1 Batch % data. The History user program populates this field only if you set the configuration parameter (61,0,18).

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
68	Comp 2 Batch Per	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines Comp 2 Batch % data. The History user program populates this field only if you set the configuration parameter (61,0,18).
69	Comp 3 Batch Per	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines Comp 3 Batch % data. The History user program populates this field only if you set the configuration parameter (61,0,18).
70	Comp 4 Batch Per	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines Comp 4 Batch % data. The History user program populates this field only if you set the configuration parameter (61,0,18).
71	Add 1 Gross Qty	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	q	1.00	Defines additive 1 gross quantity data. The History user program populates this field only if you set the configuration parameter (61,0,19).
71	RESERVED							2.00	Reserved for future use
72	Add 2 Gross Qty	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines additive 2 gross quantity data. The History user program populates this field only if you set the configuration parameter (61,0,19).
72	RESERVED						0	2.00	Reserved for future use
73	Add 3 Gross Qty	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines additive 3 gross quantity data. The History user program populates this field only if you set the configuration parameter (61,0,19).
73	RESERVED						0	2.00	Reserved for future use
74	Add 4 Gross Qty	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines additive 4 gross quantity data. The History user program populates this field only if you set the configuration parameter (61,0,19).
74	RESERVED						0	2.00	Reserved for future use
75	Add 5 Gross Qty	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines additive 5 gross quantity data. The History user program populates this field only if you set the configuration parameter (61,0,19).
75	RESERVED						0	2.00	Reserved for future use

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
76	Add 6 Gross Qty	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines additive 6 gross quantity data. The History user program populates this field only if you set the configuration parameter (61,0,19).
76	RESERVED						0	2.00	Reserved for future use
77	Operating Mode	R/O	System	UINT8	1	0 → 1	0	1.00	Defines Operating mode data. The History user program populates this field only if you set the configuration parameter (61,0,20).
78	Unit Address	R/O	System	UINT8	1	0 → 255	0	1.00	Defines Unit Address data. The History user program populates this field only if you set the configuration parameter (61,0,21).
79	Recipe Num	R/O	System	UINT8	1	0 → 30	0	1.00	Defines Recipe Number data. The History user program populates this field only if you set the configuration parameter (61,0,22).
80	Data Item 1	R/O	System	UINT32	4	0 → 99999999	0	1.00	Defines Data Item 1 data. The History user program populates this field only if you set the configuration parameter (61,0,23).
81	Data Item 2	R/O	System	UINT32	4	0 → 99999999	0	1.00	Defines Data Item 2 data. The History user program populates this field only if you set the configuration parameter (61,0,24).
82	Data Item 3	R/O	System	UINT32	4	0 → 99999999	0	1.00	Defines Data Item 3 data. The History user program populates this field only if you set the configuration parameter (61,0,25).
83	Data Item 4	R/O	System	UINT32	4	0 → 99999999	0	1.00	Defines Data Item 4 data. The History user program populates this field only if you set the configuration parameter (61,0,26).
84	Data Item 5	R/O	System	UINT32	4	0 → 99999999	0	1.00	Defines Data Item 5 data. The History user program populates this field only if you set the configuration parameter (61,0,27).
85	Start Date Time	R/O	System	TIME	4	Any valid time	0	1.00	Defines Start Date Time data. The History user program populates this field only if you set the configuration parameter (61,0,28).

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
86	End Date Time	R/O	System	TIME	4	Any valid time	0	1.00	Defines End Date Time data. The History user program populates this field only if you set the configuration parameter (61,0,29).
87	Trans Gross Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Trans Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,30).
88	Trans Std Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Trans Std Qty data. The History user program populates this field only if you set the configuration parameter (61,0,31).
89	Trans Mass	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Trans Weight data. The History user program populates this field only if you set the configuration parameter (61,0,32).
90	Meter 1 Trans Start Gross	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 1 Trans Start Gross data. The History user program populates this field only if you set the configuration parameter (61,0,33).
91	Meter 2 Trans Start Gross	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 2 Trans Start Gross data. The History user program populates this field only if you set the configuration parameter (61,0,33).
92	Meter 3 Trans Start Gross	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 3 Trans Start Gross data. The History user program populates this field only if you set the configuration parameter (61,0,33).
93	Meter 4 Trans Start Gross	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 4 Trans Start Gross data. The History user program populates this field only if you set the configuration parameter (61,0,33).
94	Meter 1 Trans Start Std	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 1 Trans Start Std data. The History user program populates this field only if you set the configuration parameter (61,0,34).

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
95	Meter 2 Trans Start Std	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 2 Trans Start Std data. The History user program populates this field only if you set the configuration parameter (61,0,34).
96	Meter 3 Trans Start Std	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 3 Trans Start Std data. The History user program populates this field only if you set the configuration parameter (61,0,34).
97	Meter 4 Trans Start Std	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 4 Trans Start Std data. The History user program populates this field only if you set the configuration parameter (61,0,34).
98	Meter 1 Trans Start Mass	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 1 Trans Start Weight data. The History user program populates this field only if you set the configuration parameter (61,0,35).
99	Meter 2 Trans Start Mass	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 2 Trans Start Weight data. The History user program populates this field only if you set the configuration parameter (61,0,35).
100	Meter 3 Trans Start Mass	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 3 Trans Start Weight data. The History user program populates this field only if you set the configuration parameter (61,0,35).
101	Meter 4 Trans Start Mass	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 4 Trans Start Weight data. The History user program populates this field only if you set the configuration parameter (61,0,35).
102	Meter 1 Trans End Gross	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 1 Trans End Gross data. The History user program populates this field only if you set the configuration parameter (61,0,36).

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
103	Meter 2 Trans End Gross	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 2 Trans End Gross data. The History user program populates this field only if you set the configuration parameter (61,0,36).
104	Meter 3 Trans End Gross	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 3 Trans End Gross data. The History user program populates this field only if you set the configuration parameter (61,0,36).
105	Meter 4 Trans End Gross	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 4 Trans End Gross data. The History user program populates this field only if you set the configuration parameter (61,0,36).
106	Meter 1 Trans End Std	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 1 Trans End Std data. The History user program populates this field only if you set the configuration parameter (61,0,37).
107	Meter 2 Trans End Std	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 2 Trans End Std data. The History user program populates this field only if you set the configuration parameter (61,0,37).
108	Meter 3 Trans End Std	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 3 Trans End Std data. The History user program populates this field only if you set the configuration parameter (61,0,37).
109	Meter 4 Trans End Std	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 4 Trans End Std data. The History user program populates this field only if you set the configuration parameter (61,0,37).
110	Meter 1 Trans End Mass	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 1 Trans End Weight data. The History user program populates this field only if you set the configuration parameter (61,0,38).
111	Meter 2 Trans End Mass	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 2 Trans End Weight data. The History user program populates this field only if you set the configuration parameter (61,0,38).

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
112	Meter 3 Trans End Mass	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 3 Trans End Weight data. The History user program populates this field only if you set the configuration parameter (61,0,38).
113	Meter 4 Trans End Mass	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Defines Meter 4 Trans End Weight data. The History user program populates this field only if you set the configuration parameter (61,0,38).
114	Trans Add 1 Gross	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defined transaction additive 1 gross quantity data. The History user program populates this field only if you set the configuration parameter (61,0,38).
114	RESERVED							2.00	Reserved for future use
115	Trans Add 2 Gross	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defined transaction additive 2 gross quantity data. The History user program populates this field only if you set the configuration parameter (61,0,38).
115	RESERVED							2.00	Reserved for future use
116	Trans Add 3 Gross	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defined transaction additive 3 gross quantity data. The History user program populates this field only if you set the configuration parameter (61,0,38).
116	RESERVED							2.00	Reserved for future use
117	Trans Add 4 Gross	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defined transaction additive 4 gross quantity data. The History user program populates this field only if you set the configuration parameter (61,0,38).
117	RESERVED							2.00	Reserved for future use
118	Trans Add 5 Gross	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defined transaction additive 5 gross quantity data. The History user program populates this field only if you set the configuration parameter (61,0,38).
118	RESERVED							2.00	Reserved for future use

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
119	Trans Add 6 Gross	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defined transaction additive 6 gross quantity data. The History user program populates this field only if you set the configuration parameter (61,0,38).
119	RESERVED							2.00	Reserved for future use
120	Transaction Record Length	R/O	System	UINT8	1	0 → 225	3	1.00	Stores the calculated transaction length. The length is calculated at every configuration change and at booting. If any parameter is of double type then such parameter will take two points in history instead of one. Length indicates number of history points required in transaction segment.
121	Maximum no. of Transactions	R/O	System	UINT16	2	0 → 10000	0	1.00	Defines the maximum number of transactions that can be archived. If user requested max transactions memory is available in history then this parameter values is equal to user defined value, else user program internally calculates how much memory can be acquired and that many transactions can be archived. This parameter value is updated as per the available transactions.
122	Transaction Stored	R/O	System	UINT16	2	0 → 10000	0	1.00	Defines how many transactions are already stored in history. Each time a 'store transaction' command is given this value increments by 1. After roll over this value is equal to the max. no. of transactions
123	Oldest Transaction	R/O	System	UINT16	2	0 → 9999	10,000	1.00	Stores transactions on FIFO basis. This field contains the oldest transaction number present in history record in Transaction segment.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
124	Clear History	R/W	User	UINT8	1	0 → 2	0	1.00	Issues clear history command. When 2 is written to this command the full history is cleared and as per present configuration new memory is acquired. When 1 is written to this command then the specified number of oldest transaction [TLP ID: 10125] is cleared, its respective batches are also cleared. 0 = normal 1 = Clear History, check if values are present in [TLPID: 10125], if no value in [TLPID: 10125] clear entire history 2 = Release and Acquire Memory.
125	No. of Transactions to clear	R/W	User	UINT16	2	0 → 10000	0	1.00	Specifies how many old transactions are to be cleared. This parameter works with Clear History command: if this parameter has a zero value, then all the history is cleared; if a non- zero value, then only specified transactions are cleared. 0 = clear all, if clear history command is 1. Non -zero = clear old transactions and their respective batches.
126	Batch Record Length	R/O	System	UINT8	1	2 → 110	0	1.22	Stores the calculated batch length. This is calculated by adding all the configured parameters for batch + 3 default points. The length is calculated at every configuration change and at booting. If any parameter is of Double type then that parameter takes two points in history instead of one. Length indicates number of history points required in Batch segment. (* default - Batch number + Transaction number)

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
127	Maximum no. of batches	R/O	System	UINT16	2	0 → 10000	0	1.00	Defines the maximum number of batches that can be archived. If user requested max transactions * archive batches per transaction memory is available in history then this parameter values is equal to user defined value, else user program internally calculates how much memory can be acquired and that many batches can be archived. This parameter value is updated as per the available transactions * archive batches per transaction.
128	Batches Stored	R/O	System	UINT16	2	0 → 10000	0	1.00	Defines how many batches are already stored in history. Each time a 'store batch' command is given this value increments by 1. After roll over this value is equal to max. no. of batches.
129	Oldest Batch	R/O	System	UINT16	2	0 → 9999	10,000	1.00	Batches are stored on FIFO basis. This field contains the oldest Batch number present in history record in Batch segment.
130	Storage Memory Full alarm config	R/W	User	UINT8	1	0 → 1	0	1.00	Configures the Storage Memory Full alarm. If this value is 1 (Lock), then: a) at Preset Verification alarm is raised when max batches equals batch stored or b) at Recipe Verification alarm is raised when max transactions equals transaction stored. 0 = Free running (overwrites old transactions) 1 =Lock (raises the and locks authorization until space is created in history by user by clear history)

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
130	Storage Memory Full alarm config	RW_ CNDL	User	UINT8	1	0 → 1	0	2.20	Configures the Storage Memory Full alarm. If this value is 1 (Lock), then: a) at Preset Verification alarm is raised when max batches equals batch stored or b) at Recipe Verification alarm is raised when max transactions equals transaction stored. 0 = Free running (overwrites old transactions) 1 =Lock (raises the alarm and locks authorization until space is created in history by user by clear history)
131	No. of Batches in a Transaction	R/O	System	UINT16	2	0 → 9999	0	1.00	Defines the number of batches in a transaction.
132	Start Batch No.	R/O	System	UINT16	2	0 → 9999	0	1.00	Defines the first batch number in a transaction.
133	Transaction Configuration Error	R/O	System	UINT8	1	0 → 1	0	1.00	When any new configuration is done related to transaction configuration parameters this parameter is set. 0 = normal 1 = configuration error
134	Batch Configuration Error	R/O	System	UINT8	1	0 → 1	0	1.00	When any new configuration is done related to batch configuration parameters this parameter is set. 0 = normal 1 = configuration error
135	Exception	R/O	System	UINT8	1	0 → 2	0	1.00	Defines the Exception raised during populating command. 0 = normal 1 = invalid transaction 2 = invalid batch (This parameter is reset after a valid batch number or transaction number is requested to be retrieved).
136	Oldest Transaction Index	R/O	System	UINT16	2	0 → 9999	0	1.00	Indicates the index number of oldest transaction stored in the transaction history segment.
137	Oldest Batch Index	R/O	System	UINT16	2	0 → 9999	0	1.00	Indicates the index number of oldest batch stored in the batch history segment.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
138	FWA Pressure	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines FWA Pressure data populated by History user program, if configured parameter is set only then this Batch data is populated.
139	FWA Base Density	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.22	Defines FWA Base Density data populated by History user program, if configured parameter is set only then this Batch data is populated
140	Range Config Error	R/O	System	UINT8	1	0 → 1	0	1.00	Range Config Error-raised if User configures Transaction or Batch related configuration any value other than 0 or 1. 0 = normal 1 = Error
141	S Comp 2 Req Per	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives Percentage of Component 2 at the end of batch, i.e. when Store Batch command [1] is received. 0 = Idle State, do not store. 1 = Store at the end of batch
142	S Comp 3 Req Per	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives Percentage of Component 3 at the end of batch, i.e. when Store Batch command [1] is received. 0 = Idle State, do not store. 1 = Store at the end of batch
143	S Comp 4 Req Per	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives Percentage of Component 4 at the end of batch, i.e. when Store Batch command [1] is received. 0 = Idle State, do not store. 1 = Store at the end of batch
144	Acquire Memory Fail	R/O	System	UINT8	1	0 → 1	0	1.00	Defines the availability of number of points in the history for batch segment and transaction segment. 0 = normal 1 = Insufficient memory as the number of points configured is greater than that available in the firmware.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
145	Archive Batches Per Transaction	R/W	User	UINT16	2	1 → 10000	4	1.00	Configures the number of batches per transaction to acquire memory for Batch Segment. 'Requested Max Transactions' * 'Archive batches per transaction' = 'Max batches' If 'Requested max transactions' is greater than the available free space then as per free space the memory is booked for storing complete batches for max. transactions possible.
146	Requested Maximum Transactions	R/W	User	UINT16	2	0 → 10000	200	1.00	Configures the maximum transactions to acquire memory for Transaction segment. If requested max transaction is greater than available free space then as per free space the memory is booked for the transactions. The booked memory is reflected in 'Max transactions'
147	RESERVED								Reserved for future use
147	History Record Status	R/O	System	UINT8	1	0 → 3	0	2.20	Indicates health of history record whose retrieval request is recently executed. Valid values are: 0 = Valid Record 1 = Invalid Record 2 = Suspect Record 3 = History API Fail on Reading
148	History Status Flag	R/O	System	UINT8	1		0	2.20	Stores status such as archiving or deletion of record in progress. Bit 0 = Deletion of requested transaction in progress Bit 1= Full release and acquire in progress Bit 2 = Batch archiving in progress Bit 3 =Transaction archiving in progress
149	RESERVED								Reserved for future use.
150	RESERVED								Reserved for future use.
151	RESERVED								Reserved for future use.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
152	S Comp Pressure	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives Avg component pressure (FWA) at the end of batch, i.e. when Store Batch command [1] is received. 0 = Idle State, do not store. 1 = Store at the end of Batch
153	S Comp Base Density	R/W	User	UINT8	1	0 → 1	0	1.20	Defines whether the history user program archives average component base density (FWA) at the end of batch, i.e. when Store Batch command [1] is received. 0 = Idle State, do not store. 1 = Store at the end of Batch
154	Comp 1 Pressure	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines Comp 1 Pressure data populated by History user program, if configured parameter is set only then this Batch data is populated
155	Comp 2 Pressure	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines Comp 2 Pressure data populated by History user program, if configured parameter is set only then this Batch data is populated
156	Comp 3 Pressure	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines Comp 3 Pressure data populated by History user program, if configured parameter is set only then this Batch data is populated
157	Comp 4 Pressure	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Defines Comp 4 Pressure data populated by History user program, if configured parameter is set only then this Batch data is populated
158	Comp 1 Base Density	R/O	System	Float	4	Any positive valid IEEE 754 Float	0	1.20	Defines Comp 1 Base Density data populated by History user program, if configured parameter is set only then this Batch data is populated
159	Comp 2 Base Density	R/O	System	Float	4	Any positive valid IEEE 754 Float	0	1.20	Defines Comp 2 Base Density data populated by History user program, if configured parameter is set only then this Batch data is populated
160	Comp 3 Base Density	R/O	System	Float	4	Any positive valid IEEE 754 Float	0	1.20	Defines Comp 3 Base Density data populated by History user program, if configured parameter is set only then this Batch data is populated

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
161	Comp 4 Base Density	R/O	System	Float	4	Any positive valid IEEE 754 Float	0	1.20	Defines Comp 4 Base Density data populated by History user program, if configured parameter is set only then this Batch data is populated
162	Driver ID 1	R/W	User	UINT32	4	0 → 999999999	0	2.00	Defines 1 of 32 valid driver IDs allowed to authorize a new transaction. In manual mode, this ID is checked and validated against TLP 63,0,245.
163	Driver ID 2	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
164	Driver ID 3	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
165	Driver ID 4	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
166	Driver ID 5	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
167	Driver ID 6	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
168	Driver ID 7	R/W	User	UINT32	4	0 -> 999999999	0	2.00	See description of parameter 162.
169	Driver ID 8	R/W	User	UINT32	4	0 -> 999999999	0	2.00	See description of parameter 162.
170	Driver ID 9	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
171	Driver ID 10	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
172	Driver ID 11	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
173	Driver ID 12	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
174	Driver ID 13	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
175	Driver ID 14	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
176	Driver ID 15	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
177	Driver ID 16	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
178	Driver ID 17	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
179	Driver ID 18	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
180	Driver ID 19	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
181	Driver ID 20	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
182	Driver ID 21	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
183	Driver ID 22	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
184	Driver ID 23	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
185	Driver ID 24	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
186	Driver ID 25	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
187	Driver ID 26	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
188	Driver ID 27	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
189	Driver ID 28	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
190	Driver ID 29	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
191	Driver ID 30	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
192	Driver ID 31	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
193	Driver ID 32	R/W	User	UINT32	4	0 → 999999999	0	2.00	See description of parameter 162.
194	Page Length	R/W	User	UINT8	1	0 → 120	0	1.00	Page length.
194	RESERVED							2.00	Reserved for future use
195	S Batch Start Indicated	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program archives Batch Start Indicated Reading at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch
196	S Batch End Indicated	R/W	User	UINT8	1	0 → 1	0	1.20	Defines whether the history user program archives Batch End Indicated Reading at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch
197	Meter 1 Batch Start Indicated	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows Meter 1 Batch Start Indicated data. The History user program populates this field only if you set the configuration parameter (61,0,195).
198	Meter 2 Batch Start Indicated	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows Meter 2 Batch Start Indicated data. The History user program populates this field only if you set the configuration parameter (61,0,195).
199	Meter 3 Batch Start Indicated	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows Meter 3 Batch Start Indicated data. The History user program populates this field only if you set the configuration parameter (61,0,195).

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
200	Meter 4 Batch Start Indicated	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows Meter 4 Batch Start Indicated data. The History user program populates this field only if you set the configuration parameter (61,0,195).
201	Meter 1 Batch End Indicated	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows Meter 1 Batch End Indicated data. The History user program populates this field only if you set the configuration parameter (61,0,196).
202	Meter 2 Batch End Indicated	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows Meter 2 Batch End Indicated data. The History user program populates this field only if you set the configuration parameter (61,0,196).
203	Meter 3 Batch End Indicated	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows Meter 3 Batch End Indicated data. The History user program populates this field only if you set the configuration parameter (61,0,196).
204	Meter 4 Batch End Indicated	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows Meter 4 Batch End Indicated data. The History user program populates this field only if you set the configuration parameter (61,0,196).
205	S Average Component K-factor (FWA)	R/W	User	UINT8	1	0 → 1	0	1.10	Defines whether the history user program should archive the Average component K- factor (FWA) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch
206	S Average Component Meter factor (FWA)	R/W	User	UINT8	1	0 → 1	0	1.00	Defines whether the history user program should archive the Average component meter factor (FWA) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
207	Component 1 Average K-factor (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.00	Defines average k-factor (FWA) for component 1. The History user program populates this data only if you set the configuration parameter (61,0,205).
208	Component 2 Average K-factor (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.00	Defines average k-factor (FWA) for component 2. The History user program populates this data only if you set the configuration parameter (61,0,205).
209	Component 3 Average K-factor (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.00	Defines average k-factor (FWA) for component 3. The History user program populates this data only if you set the configuration parameter (61,0,205).
210	Component 4 Average K-factor (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.00	Defines average k-factor (FWA) for component 4. The History user program populates this data only if you set the configuration parameter (61,0,205).
211	Component 1 Average Meter Factor (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.00	Defines average meter factor (FWA) for component 1. The History user program populates this data only if you set the configuration parameter (61,0,206).
212	Component 2 Average Meter Factor (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.00	Defines average meter factor (FWA) for component 2. The History user program populates this data only if you set the configuration parameter (61,0,206).
213	Component 3 Average Meter Factor (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.00	Defines average meter factor (FWA) for component 3. The History user program populates this data only if you set the configuration parameter (61,0,206).
214	Component 4 Average Meter Factor (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.00	Defines average meter factor (FWA) for component 4. The History user program populates this data only if you set the configuration parameter (61,0,206).

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
215	S Average component CTL (FWA)	R/W	User	UINT8	1	0 → 1	0	1.20	Defines whether the history user program should archive the Average component CTL (FWA) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch
216	S Average component CPL (FWA)	R/W	User	UINT8	1	0 → 1	0	1.20	Defines whether the history user program should archive the Average component CPL (FWA) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch
217	Component 1 CTL (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.20	Defines average CTL (FWA) for component 1. The History user program populates this data only if you set the configuration parameter (61,0,215).
218	Component 2 CTL (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.20	Defines average CTL (FWA) for component 2. The History user program populates this data only if you set the configuration parameter (61,0,215).
219	Component 3 CTL (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.20	Defines average CTL (FWA) for component 3. The History user program populates this data only if you set the configuration parameter (61,0,215).
220	Component 4 CTL (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.20	Defines average CTL (FWA) for component 4. The History user program populates this data only if you set the configuration parameter (61,0,215).
221	Component 1 CPL (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.20	Defines average CPL (FWA) for component 1. The History user program populates this data only if you set the configuration parameter (61,0,216).

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
222	Component 2 CPL (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.20	Defines average CPL (FWA) for component 2. The History user program populates this data only if you set the configuration parameter (61,0,216).
223	Component 3 CPL (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.20	Defines average CPL (FWA) for component 3. The History user program populates this data only if you set the configuration parameter (61,0,216).
224	Component 4 CPL (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.20	Defines average CPL (FWA) for component 4. The History user program populates this data only if you set the configuration parameter (61,0,216).
225	S Comp Observed Density	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.20	Defines whether the history user program should archive the Avg component observed density (FWA) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of Batch
226	Comp 1 Observed Density	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.20	Defines Comp 1 Observed Density values. The History user program populates this data only if you set the configuration parameter (61,0,225).
227	Comp 2 Observed Density	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.20	Defines Comp 2 Observed Density values. The History user program populates this data only if you set the configuration parameter (61,0,225).
228	Comp 3 Observed Density	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.20	Defines Comp 3 Observed Density values. The History user program populates this data only if you set the configuration parameter (61,0,225).
229	Comp 4 Observed Density	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.20	Defines Comp 4 Observed Density values. The History user program populates this data only if you set the configuration parameter (61,0,225).

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
230	Batch Configuration Mode	R/O	System	UINT8	1	$0 \rightarrow 1$	0	1.20	Indicates that given batch was completed in normal mode (W&M key locked) or in configuration mode (W&M key open). This batch data is archived and always populated (archiving of this parameter is not configurable). Valid values are: 0 = Normal Mode 1 = Configuration Mode
231	RESERVED							1.00	Reserved for future use.
231	S Swing Arm Side	R/W	User	UINT8	1	$0 \rightarrow 1$	0	2.00	Defines whether the History user program should archive the Transaction swing arm side (64,0,27) at the end of transaction (at receipt of the Store Transaction command). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of Transaction
232	RESERVED							1.22	Reserved for future use.
232	Swing Arm Side	R/O	System	UINT8	1	$0 \rightarrow 2$	0	2.00	Defines transaction swing arm side. The History user program populates this field only if you set the configuration parameter (61,0,231).
233	RESERVED							1.22	Reserved for future use.
233	Add 1 Gross Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Float	0	2.00	Defines additive 1 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,19).
234	RESERVED							1.22	Reserved for future use.
234	Add 2 Gross Qty	R/O	System	Double	4	0.0 to any positive valid IEEE 754 Float	0	2.00	Defines additive 2 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,19).
235	RESERVED							1.22	Reserved for future use.
235	Add 3 Gross Qty	R/O	System	Double	4	0.0 to any positive valid IEEE 754 Float	0	2.00	Defines additive 3 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,19).
236	RESERVED							1.22	Reserved for future use.

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
236	Add 4 Gross Qty	R/O	System	Double	4	0.0 to any positive valid IEEE 754 Float	0	2.00	Defines additive 4 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,19).
237	RESERVED							1.22	Reserved for future use.
237	Add 5 Gross Qty	R/O	System	Double	4	0.0 to any positive valid IEEE 754 Float	0	2.00	Defines additive 5 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,19).
238	RESERVED							1.22	Reserved for future use.
238	Add 6 Gross Qty	R/O	System	Double	4	0.0 to any positive valid IEEE 754 Float	0	2.00	Defines additive 6 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,19).
239	RESERVED							1.22	Reserved for future use.
239	Trans Add 1 Gross	R/O	System	Double	4	0.0 to any positive valid IEEE 754 Float	0	2.00	Defines Trans Additive 1 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,39).
240	RESERVED							1.22	Reserved for future use.
240	Trans Add 2 Gross	R/O	System	Double	4	0.0 to any positive valid IEEE 754 Float	0	2.00	Defines Trans Additive 2 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,39).
241	RESERVED							1.22	Reserved for future use.
241	Trans Add 3 Gross	R/O	System	Double	4	0.0 to any positive valid IEEE 754 Float	0	2.00	Defines Trans Additive 3 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,39).
242	RESERVED							1.22	Reserved for future use.
242	Trans Add 4 Gross	R/O	System	Double	4	0.0 to any positive valid IEEE 754 Float	0	2.00	Defines Trans Additive 4 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,39).
243	RESERVED							1.22	Reserved for future use.

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
243	Trans Add 5 Gross	R/O	System	Double	4	0.0 to any positive valid IEEE 754 Float	0	2.00	Defines Trans Additive 5 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,39).
244	RESERVED							1.22	Reserved for future use.
244	Trans Add 6 Gross	R/O	System	Double	4	0.0 to any positive valid IEEE 754 Float	0	2.00	Defines Trans Additive 6 Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,39).
245	RESERVED							1.22	Reserved for future use.
245	S Composite Batch Gross Qty	R/W	User	UINT8	1	$0 \rightarrow 1$	0	2.00	Defines whether the History user program archives the Composite Gross Del Qty (Batch) (64,0,2) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of batch
246	RESERVED							1.22	Reserved for future use.
246	Composite Batch Gross Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	2.00	Defines Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,245).
247	RESERVED							1.22	Reserved for future use.
247	S Composite Trans Gross Qty	R/W	User	UINT8	1	$0 \rightarrow 1$	0	2.00	Defines whether the History user program archives the Composite Gross Del Qty (Transaction) (64,0,3) at the end of transaction (when the Store Transaction command is received). Valid values are: 0 = Idle State, do not store. 1 = Store at the end of transaction
248	RESERVED							1.22	Reserved for future use.
248	Composite Trans Gross Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	2.00	Defines Composite Trans Gross Qty data. The History user program populates this field only if you set the configuration parameter (61,0,247).

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
249	S Density Unit	R/O	System	UINT8	1	$0 \rightarrow 1$	1	1.22	Defines whether the History user program should archive the Density Units Option (70,0,3) at the end of batch (when the Store Batch command is received). Valid values are: 0 = Idle State, do not store 1 = Store at the end of Batch
250	Density Units	R/O	System	UINT8	1	$0 \rightarrow 1$	0	1.22	Defines Density Units Option data. The History user program populates this field only if you set the configuration parameter (61,0,249).
251	Base Temp Options	R/O	System	UINT8	1	$0 \rightarrow 1$	0	1.22	Defines Base Temp Option data. The History user program populates this field only if you set the configuration parameter (61,0,5).
252	Archive Error	R/O	System	UINT16	2	As per bits used	0	2.20	Sets when archiving fails for any error. Resets when the transaction/batch for which archiving failed archives successfully.
252.0	Transaction archive failed at firmware								Firmware is unable to archive data.
252.1	Transaction archive failed at CRC								Cyclical redundancy check does not match.
252.2	Batch archiving failed								Batch archiving failed; DL8000 does not attempt transaction archiving
252.3	Transaction archive timeout								Transaction archive did not complete in specified time.
252.4	RESERVED								Reserved for future use
252.5	RESERVED								Reserved for future use
252.6	RESERVED								Reserved for future use
252.7	RESERVED								Reserved for future use
252.8	Batch Archive Failed at Firmware								Firmware is unable to archive data.
252.9	Batch Archive failed at CRC								Cyclical redundancy check does not match.
252.10	Batch archive timeout								Batch archive did not complete in specified time.
252.11	RESERVED								Reserved for future use
252.12	RESERVED								Reserved for future use
252.13	RESERVED								Reserved for future use

Point Type 61: Transaction History

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
252.14	RESERVED								Reserved for future use
252.15	RESERVED								Reserved for future use
253	Archive Fail Transaction Number	R/O	System	UINT16	2	0 → 10000	10000	2.20	Assigns a number to the failed transaction archive when the archive error occurs during transaction archiving. This value resets to 10000 when the transaction-related error resets.
254	Archive Fail Batch Number	R/O	System	UNIT16	2	0 → 10000	10000	2.20	Assigns a number to the failed batch archive when the archive error occurs during batch archiving. This value resets to 10000 when the batch-related error resets.

3.4.3 Point Type 62: Keypad Display Parameters

Description: Point type 62 defines Keypad Navigation parameters.

Number of Logical Points: 1 logical point for each parameter.

Storage Location: Point type 62 is saved to internal configuration memory.

Table 3-4: Point Type 62, Keypad Navigation Parameters

Point Type 62: Keypad Navigation Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	TAG	R/W	User	String20	20	Any ASCII string	Keypad Navigation	1.00	A 20-character description of channel. (Not in use)
1	RESERVED								Reserved for future use
2	RESERVED								Reserved for future use
3	RESERVED								Reserved for future use
4	RESERVED								Reserved for future use
5	RESERVED								Reserved for future use
6	Info Message	R/W	System	String20	20	Any ASCII string		1.00	Status message sent by Batching user program.
7	LCD Video Mode	R/W	System	UINT8	1	0 → 1	0	1.00	0 – Dark characters on light background 1 – Light characters on dark background
8	Display Type	R/W	User	UINT8	1	0 → 1	0	1.00	0 – C1D1 1 – C1D2 (Not in use)
9	Flash Version	R/O	System	String7	7	Any ASCII string	#VERSIO	1.00	Version of the flash image currently in the keypad board.
10	Comm Port	R/O	User	UINT8	1	Comm 2 → Comm 5	2	1.00	Communication port to configure and talk over (Port set by user using ROCLINK or Batching User program display #11)
11	Board Status	R/O	System	UINT8	1	0 → 2	0	1.00	0 – Not Installed 1 – Installed 2 – LCD Error

Point Type 62: Keypad Navigation Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	Num Group 1 PINs	R/W	System	UINT8	1	0 → 100	1	1.00	Number of Pins that have the highest security clearance. This is to say PIN 1 – NUM are group 1
13	RESERVED								Reserved for future use
14	RESERVED								Reserved for future use
15	Tag Item 2	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
16	Tag Item 3	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
17	Tag Item 4	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
18	Tag Item 5	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
19	Tag Item 6	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
20	Tag Item 7	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
21	Tag Item 8	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
22	Tag Item 9	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
23	Tag Item 10	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
24	Tag Item 11	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
25	Tag Item 12	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
26	Tag Item 13	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
27	Tag Item 14	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
28	Tag Item 15	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
29	Tag Item 16	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
30	Tag Item 17	R/W	User	String10	10	Any ASCII string	“ ”	1.00	Tag line for dynamic data while batching
31	RESERVED								Reserved for future use
32	Data Item 2	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	Tlp that points to data to display

Point Type 62: Keypad Navigation Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
33	Data Item 3	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	TLP that points to data to display
34	Data Item 4	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	TLP that points to data to display
35	Data Item 5	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	TLP that points to data to display
36	Data Item 6	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	TLP that points to data to display
37	Data Item 7	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	TLP that points to data to display
38	Data Item 8	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	TLP that points to data to display
39	Data Item 9	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	TLP that points to data to display
40	Data Item 10	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	TLP that points to data to display
41	Data Item 11	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	TLP that points to data to display
42	Data Item 12	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	TLP that points to data to display
43	Data Item 13	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	TLP that points to data to display
44	Data Item 14	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	TLP that points to data to display
45	Data Item 15	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	TLP that points to data to display
46	Data Item 16	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	TLP that points to data to display
47	Data Item 17	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	TLP that points to data to display
48	Login 1	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
49	Login 2	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
50	Login 3	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
51	Login 4	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
52	Login 5	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
53	Login 6	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
54	Login 7	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
55	Login 8	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
56	Login 9	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
57	Login 10	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens

Point Type 62: Keypad Navigation Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
58	Login 11	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
59	Login 12	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
60	Login 13	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
61	Login 14	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
62	Login 15	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
63	Login 16	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
64	Login 17	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
65	Login 18	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
66	Login 19	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
67	Login 20	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
68	Login 21	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
69	Login 22	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
70	Login 23	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
71	Login 24	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
72	Login 26	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
73	Login 26	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
74	Login 27	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
75	Login 28	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
76	Login 29	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens

Point Type 62: Keypad Navigation Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
77	Login 30	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
78	Login 31	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
79	Login 32	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
80	Login 33	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
81	Login 34	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
82	Login 35	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
83	Login 36	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
84	Login 37	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
85	Login 38	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
86	Login 39	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
87	Login 40	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
88	Login 41	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
89	Login 42	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
90	Login 43	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
91	Login 44	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
92	Login 45	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
93	Login 46	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
94	Login 47	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
95	Login 48	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens

Point Type 62: Keypad Navigation Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
96	Login 49	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
97	Login 50	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
98	Login 51	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
99	Login 52	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
100	Login 53	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
101	Login 54	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
102	Login 55	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
103	Login 56	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
104	Login 57	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
105	Login 58	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
106	Login 59	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
107	Login 60	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
108	Login 61	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
109	Login 62	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
110	Login 63	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
111	Login 64	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
112	Login 65	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
113	Login 66	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
114	Login 67	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens

Point Type 62: Keypad Navigation Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
115	Login 68	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
116	Login 69	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
117	Login 70	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
118	Login 71	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
119	Login 72	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
120	Login 73	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
121	Login 74	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
122	Login 75	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
123	Login 76	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
124	Login 77	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
125	Login 78	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
126	Login 79	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
127	Login 80	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
128	Login 81	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
129	Login 82	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
130	Login 83	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
131	Login 84	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
132	Login 85	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens
133	Login 86	R/W	User	UINT16	2	0 → 65535	0	1.00	Login PIN to access special screens

Point Type 62: Keypad Navigation Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
134	Login 87	R/W	User	UINT16	2	$0 \rightarrow 65535$	0	1.00	Login PIN to access special screens
135	Login 88	R/W	User	UINT16	2	$0 \rightarrow 65535$	0	1.00	Login PIN to access special screens
136	Login 89	R/W	User	UINT16	2	$0 \rightarrow 65535$	0	1.00	Login PIN to access special screens
137	Login 90	R/W	User	UINT16	2	$0 \rightarrow 65535$	0	1.00	Login PIN to access special screens
138	Login 91	R/W	User	UINT16	2	$0 \rightarrow 65535$	0	1.00	Login PIN to access special screens
139	Login 92	R/W	User	UINT16	2	$0 \rightarrow 65535$	0	1.00	Login PIN to access special screens
140	Login 93	R/W	User	UINT16	2	$0 \rightarrow 65535$	0	1.00	Login PIN to access special screens
141	Login 94	R/W	User	UINT16	2	$0 \rightarrow 65535$	0	1.00	Login PIN to access special screens
142	Login 95	R/W	User	UINT16	2	$0 \rightarrow 65535$	0	1.00	Login PIN to access special screens
143	Login 96	R/W	User	UINT16	2	$0 \rightarrow 65535$	0	1.00	Login PIN to access special screens
144	Login 97	R/W	User	UINT16	2	$0 \rightarrow 65535$	0	1.00	Login PIN to access special screens
145	Login 98	R/W	User	UINT16	2	$0 \rightarrow 65535$	0	1.00	Login PIN to access special screens
146	Login 99	R/W	User	UINT16	2	$0 \rightarrow 65535$	0	1.00	Login PIN to access special screens
147	Login 100	R/W	User	UINT16	2	$0 \rightarrow 65535$	0	1.00	Login PIN to access special screens
148	Weights and Measures	R/O	System	UINT8	1	$0 \rightarrow 1$	(Obtained from system)	1.00	Weights and measures parameter in order to add to display

Point Type 62: Keypad Navigation Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
149	Last Key Pressed	R/W	System	UINT8	1	0 → 19		1.00	0 - Exit 1 - Clear 2 - Stop 3 - Start 4 - Up Arrow 5 - Down Arrow 6 - Right Arrow 7 - Left Arrow 8 - Backspace 9 - Enter 10 - Brightness Up 11 - Brightness Down 12 - Print 13 - Program 14 - Select 24 - Data key (0 – 9)
150	RESERVED								Reserved for future use
151	Resolution	R/W	User	UINT8	1	0 → 2	0	1.00	INTEGER = 0 TENTHS = 1 HUNDRETHS = 2
152	Entry in Progress	R/O	System	UINT8	1	0 → 1	0	1.00	NOT_IN_PROG 0 IN_PROG 1
153	RESERVED								Reserved for future use
154	Parameter Val update status	R/W	System	UINT8	1	0 → 1	0	2.2	DISPLAY_FREE = 0 DISPLAY_LOCKED = 1
155	RESERVED								Reserved for future use
156	RESERVED								Reserved for future use
157	RESERVED								Reserved for future use
158	RESERVED								Reserved for future use
159	RESERVED								Reserved for future use
160	RESERVED								Reserved for future use
161	RESERVED								Reserved for future use
162	RESERVED								Reserved for future use
163	RESERVED								Reserved for future use
164	RESERVED								Reserved for future use
165	RESERVED								Reserved for future use
166	RESERVED								Reserved for future use
167	RESERVED								Reserved for future use
168	RESERVED								Reserved for future use

Point Type 62: Keypad Navigation Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
169	RESERVED								Reserved for future use
170	RESERVED								Reserved for future use
171	RESERVED								Reserved for future use
172	RESERVED								Reserved for future use
173	RESERVED								Reserved for future use
174	RESERVED								Reserved for future use
175	RESERVED								Reserved for future use
176	RESERVED								Reserved for future use
177	RESERVED								Reserved for future use
178	RESERVED								Reserved for future use
179	RESERVED								Reserved for future use
180	RESERVED								Reserved for future use
181	RESERVED								Reserved for future use
182	RESERVED								Reserved for future use
183	RESERVED								Reserved for future use
184	RESERVED								Reserved for future use
185	Display Test On Batch Start	R/W_ CNDL	User	UINT8	1	0 → 255	0	2.34	This parameter enable/disable display test before actual loading started. If it is enabled, the test will be started when user presses start key OR start command received from TAS. It switches every pixel of right and left screen. This is added for Industry Canada approval.
186	RESERVED								Reserved for future use
187	Liquid Turbine 1 APM Level	R/W	System	UINT8	1	0 → 255	255	2.34	Parameter used by Keypad display user program to read which APM Level is used by Liquid turbine 1. This will be displayed in "Auditor status menu" introduced for Industry Canada requirements
188	Liquid Turbine 2 APM Level	R/W	System	UINT8	1	0 → 255	255	2.34	Parameter used by Keypad display user program to read which APM Level is used by Liquid turbine 2. This will be displayed in "Auditor status menu" introduced for Industry Canada requirements

Point Type 62: Keypad Navigation Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
189	Liquid Turbine 3 APM Level	R/W	System	UINT8	1	0 → 255	255	2.34	Parameter used by Keypad display user program to read which APM Level is used by Liquid turbine 3. This will be displayed in “Auditor status menu” introduced for Industry Canada requirements
190	Liquid Turbine 4 APM Level	R/W	System	UINT8	1	0 → 255	255	2.34	Parameter used by Keypad display user program to read which APM Level is used by Liquid turbine 4. This will be displayed in “Auditor status menu” introduced for Industry Canada requirements

3.4.4 Point Type 63: General Preset Parameters

Description: Point type 63 defines general preset parameters.

Number of Logical Points: 1 logical point for each parameter.

Storage Location: Point type 63 is saved to internal configuration memory.

Table 3-5: Point Type 63, General Preset Parameters

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Preset Quantity	R/W	User	Float	4	0.0 to any positive valid IEEE 754 float	0	1.00	Operator-entered preset quantity. System resets this TLP to zero after reading and writes new preset to TLP 63,0,39.
1	Recipe Name (Selected)	R/O	System	String20	20	ASCII String	No Recipe Selected	1.22	Updated when new recipe is selected (depends on recipe number). **Note**: This corresponds to the recipe name (TLP 67,x,0) of the selected recipe (TLP 63,0,138).
2	RESERVED								Reserved for future use
3	Quantity Remaining	R/O	System	Float	4	Any valid IEEE 754 float	0	1.00	Remaining quantity to be delivered in the batch. System initializes value equal to batch preset when new batch is authorized.
4	Max Transaction Limit	R/W	User	Float	4	5 → 9999999	3000	1.00	Defines the maximum transaction limit verified at the time of preset verification. Error code 9TLP 63,0,95) is set if new batch preset pushes the transaction delivered totalizer (based on 'delivery type') to more than this limit.
5	RESERVED								Reserved for future use
6	RESERVED								Reserved for future use

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
7	Current Component	R/O	System	UINT8	1	1 → 5	1	1.00	Specifies component index. It increments by one when next component starts. Values 1 to 4 indicate component index considering maximum of 4 components. Value 5 indicates flushing is occurring. System resets value to 1 when new batch is entered. **Note**: Use for sequential blending (TLP 63.0.12).
8	RESERVED								Reserved for future use
9	Batching Status	R/O	System	UINT8	1	Any valid value	0	1.22	Indicates the current batching status of state machine for the configured Unit Type. State machine run inside the batching user program specific to the unit/blender type.
10	Recipe Selection	R/W	KD/TA/ System	UINT8	1	1 → 30	0	1.00	Enables user-selection of recipe number. System resets this value to 0 after the batching user program reads the number. In **manual operating mode**, the system accepts the recipe number if the transaction is not authorized and the number passes recipe verification; the system then copies the number to 63,0,118. In **automatic operating mode**, the number is accepted if the transaction is not authorized. **Note**: The default value of zero (0) is required to provide tip change event to this parameter's user program.
11	Preset Alarming	R/W	User	UINT8	1	0 → 1	1	1.00	Defines whether system sends alarms to the alarms log when any alarm maintained by Batching module is raised or cleared. Valid values are: 0 = Disabled (does not generate alarm logs) 1 = Enabled (generates alarm logs for alarms maintained by Batching module)

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	Unit Type	R/W_ CNDL	User	UINT8	1	0 → 24	0	1.00	Sets the method of controlling batch deliveries. Valid values are: 0 = Sequential (auto) Performs sequential blending. One to 4 components are loaded sequentially, one at a time. Block valves are controlled automatically. 1 = Sequential (Manual): Not used 2 = In-line: Performs in-line proportional or in-line non-proportional blending (depending on recipe configuration). One or more components load simultaneously with flow for each component measured by a separate flow meter and controlled by a separate digital flow control valve.
13	Valve Type	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00	Sets the flow control value (FCV) type the system uses. All flow control valves in the system must be the same type. Valid values are: 0 = Std digital The flow control valve is a standard digital type, which automatically adjusts to match a setpoint value. The DL8000 can lock the flowrate at a configured value for greatest accuracy. 1 = Std 2-stage The flow control valve is a standard 2-stage type, which can also control simple on-off valves. Flowrates achieved are a function of line pressure. 3 = Analog (2-Analog Valve)
14	Language	R/W	User	UINT8	1	0 → 2	0	1.23	Sets the language used. Valid values are: 0 = English 1 = Spanish 2 = Portuguese
15	RESERVED							1.00	Reserved for future use

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
15	Internal Unauth Quantity Reset	R/W	User	UINT8	1	0 → 1		2.00	Resets the internal unauthorized total (maintained for the alarm) to zero when you authorize a new batch. This prevents the issue of an unauthorized flow alarm. Valid values are 1 (Enable the reset) or 0 (Disable the reset).
16	Date Format	R/W_ CNDL	User/KD	UINT8	1	0 → 2	0	1.00	Sets the date format used for keypad and display. Valid values are: 0 = MM/DD/YY 1 = DD/MM/YY 2 = YY/MM/DD

17	Low Flow Alarm Action	R/W	User	UINT8	1	0 → 4	4	1.22	Defines the severity (action taken) if the Low Flow Meter # alarm occurs. Valid values are:
									0 = Off
									1 = Display
									2 = Display & stop batch
									3 = Display, stop batch, & close contact
									4 = Display, stop batch, close contact, & lock unit.

18	High Flow Alarm Action	R/W	User	UINT8	1	0 → 4	4	1.22	Defines the severity (action taken) if the High Flow Meter # alarm occurs. Valid values are:
									0 = Off
									1 = Display
									2 = Display & stop batch
									3 = Display, stop batch, & close contact
									4 = Display, stop batch, close contact, & lock unit.

19	Number of Valves	R/O	User	UINT8	1	1 → 4	1	1.00	Sets the number of flow control valves in the system. You must define at least **one** flow control valve. **Note**: This parameter is defined as read-only so it can **only** be changed by the Preset user program. Value of this parameter is always equal to Number of Meters (63,0,20) as there is a one-to-one correspondence between logicals of meter and valve point types.

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
20	Number of Meters	R/W	User	UINT8	1	1 → 4	1	1.00	Sets the total number of flow meters for forward flow in the system. You must define at least **one** flow mete.
21	Num Comp (in system)	R/W	User	UINT8	1	1 → 4	1	1.00	Sets the number of liquid components available in the system. You must define at least **one** component.
22	Ramp Clicks	R/W	User	UINT16	2	0 → 999	30	1.00	Sets the maximum number of attempts to increase flowrate (for recovery) before halting attempts and maintaining current or fail-back flowrate. **Note**: For digital valves **only**.
23	Fallback delay(s)	R/W	User	UINT16	2	0 → 999	30	1.00	Sets, in seconds, the maximum allowed time to attain the target flowrate before performing fallback. **Note**: For digital valves **only**.
24	RESERVED								Reserved for future use
25	RESERVED								Reserved for future use
26	Number of Recipes	R/W	User	UINT8	1	1 → 30	1	1.00	Sets the number of recipes available in the system. You must define at least **one** recipe; if you define only one, the system permits automatic authorization of transactions in manual operating mode.
27	Minimum Preset Quantity	R/W_ CNDL	User	Float	4	0 (excluded) → 9999999	50	1.00	Sets the minimum quantity (gross volume or net standard volume or mass, depending on the Preset Delivery Type value (63,0,29) configured) that can be delivered in a single batch. **Note**: You cannot start or restart a batch if the remaining quantity is less than the minimum preset quantity.
28	Maximum Preset Quantity	R/W	User	Float	4	5 → 9999999	3000	1.00	Sets the maximum quantity (gross volume or net standard volume or mass, depending on the Preset Delivery Type value (63,0,29) configured) that can be preset in a single batch.

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
29	Preset Delivery Type	R/W_CNDL	User	UINT8	1	$0 \rightarrow 4$	1	1.00	Sets the quantity used for preset, loaded, and remaining quantities. Ramp up to high flowrate is also based on gross quantity; ramp down to low flowrate and flow control valve closure is based on the quantity this parameter indicates. Valid values are: 0 = Indicated volume 1 = Gross volume 2 = Gross Standard volume 3 = Net Standard volume 4 = Mass **Note**: Options 0 and 2 are not currently supported.
30	Type of Display Quantity	R/W_CNDL	User	UINT8	1	$0 \rightarrow 2$	0	1.00	Selects the quantity used for display purposes. Valid values are: 0 = Gross volume 1 = Net standard volume 2 = Mass volume
31	Recovery delay(s)	R/W	User	UINT16	2	$0 \rightarrow 999$	100	1.00	Sets, in seconds, the time to stay at the fallback flowrate before starting recovery. **Note**: For digital valves **only**.
32	Com Port 2	R/W	User	UINT8	1	$0 \rightarrow 4$	0	1.00	Defines Com port 2. You can configure this port for the following applications: 0 = No Application. 1 = Modicon Modbus 2 = DL6000 Protocol. 3 = Brooks Protocol (not currently supported) 4 = Data Logging/printer.
33	Primary Component	R/W	User	UINT8	1	$1 \rightarrow 4$	1	1.00	Select the component number used for line flushing at the end of a batch delivery. Usually the component of highest octane is defined as the primary component.
34	Ramp Down Time	R/W	User	UINT16	2	$0 \rightarrow 999$	4	1.00	Sets, in seconds, the time limit for attempting to ramp down flowrate before triggering an “Unable to Ramp Down” alarm.

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
35	Ramp Down Alarm Action	R/W	User	UINT8	1	0 → 4	4	1.00	Defines the severity (action taken) if the Ramp Down alarm occurs (that is, the preset cannot reduce flowrate within the time indicated by Ramp Down Time [63,0,34]). Valid values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit
36	Operating mode	R/W	User	UINT8	1	0 → 1	1	1.00	Sets the preset's operating mode. Valid values are: 0 = Auto A terminal automation system (TAS) maintains bi-directional communications with the preset and monitors and controls batch delivery operations. 1 = Manual A TAS maintains bi-directional communications with the preset and monitors the batch delivery operations. The preset does not accept control functions issued from the TAS.
37	Num Comp (in recipe)	R/O	System	UINT8	1	1 → 4	1	1.00	Indicates the number of components present in recipe. The system updates this value when a new recipe is selected.
38	Low Flow Time	R/W_ CNDL	User	UINT16	2	5 → 999	10	1.00	Sets, in seconds, the maximum time period the flowrate is permitted to drop below the Minimum Flowrate (75,x,2) before issuing the Low Flow alarm.
39	Preset Read Qty	R/O	System	Float	4	0.0 to any positive valid IEEE 754 float	0	1.00	Indicates the newly entered preset quantity (63,0,0). It is accepted when the transaction is authorized but the batch is not authorized.
40	High Flow Time	R/W_ CNDL	User	UINT16	2	5 -> 999	10	1.00	Sets, in seconds, the time period the flowrate is allowed to be at or exceed the Maximum Flowrate (75,0,3) before issuing the High Flow alarm.

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
41	Over Run Limit Quantity	R/W	User	Float	4	0.0 → 99.9	2.0	1.00	Sets the allowable quantity, in excess of the batch/component preset quantity, to be delivered before issuing the Unable to Close the Valve Meter # or Overflow Preset alarm. **Note**: Setting this value to zero **disables** this function and poses a significant safety risk to your site. If your site **does no**t have overrun limit hardware installed, **do not** set this value to zero.
42	Under Flow Alarm Action	R/W	User	UINT8	1	0 → 4	0	1.00	Defines the severity (action taken) if the Under Flow alarm occurs. Valid values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit.
43	Under Flow Limit Quantity	R/W	User	Float	4	0.0 → 99.9	5.0	1.00	Sets the allowable quantity by which the loaded quantity can be less than the preset quantity before issuing the "Valve Closed Early Meter #" alarm.
44	No Flow t-o Alarm Action	R/W	User	UINT8	1	0 → 4	4	1.00	Defines the severity (action taken) if the No Flow alarm occurs. Valid values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit
45	No Flow t-o Time	R/W	User	UINT16	2	1 → 99	5	1.00	Sets, in seconds, the allowable time to elapse after the flow control valve opens when no pulses are received, at which time a No Flow Meter # alarm occurs.

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
46	Unauthorized Flow Quantity	R/W	User	Float	4	0.0 → 99.9	10	1.00	Sets the allowable quantity of flow the system can record before issuing an Unauthorized Flow Meter # primary alarm. Unauthorized flow occurs when the flow control valve is closed but flow is still present.
47	Alarm Bitmap 1	R/O	System	UINT32	4	0 → 4294967295	0	1.00	Maintain alarm status for alarms 0 through 31. One bit is used for each alarm; when raised, respective bit is set to 1.
48	Alarm Bitmap 2	R/O	System	UINT32	4	0 → 4294967295	0	1.00	Maintain alarm status for alarms 32 through 63 alarms. One bit is used for each alarm; when raised, respective bit is set to 1.
49	Com Port 3	R/W	User	UINT8	1	0 → 4	0	1.00	Defines Com port 3. This port could be configured for the following applications: 0 = No Application. 1 = Modicon Modbus 2 = DL6000 Protocol. 3 = Brooks Protocol.(not currently supported) 4 = Data Logging/Print.
50	Alarm Priority 1	R/O	System	String20	20	ASCII string	Null	1.00	Contains name of highest priority alarm. Needed to display active alarms in the Alarm Browsing screen. The Keypad user program requires a list of six active alarms.
51	Alarm Priority 2	R/O	System	String20	20	ASCII string	Null	1.00	Contains name of 2nd highest priority alarm, displayed in 2nd line of Alarm Browsing screen.
52	Alarm Priority 3	R/O	System	String20	20	ASCII string	Null	1.00	Contains name of 3rd highest priority alarm, displayed in 3rd line of Alarm Browsing screen.
53	Alarm Priority 4	R/O	System	String20	20	ASCII string	Null	1.00	Contains name of 4th highest priority alarm, displayed in 4th line of Alarm Browsing screen.
54	Alarm Priority 5	R/O	System	String20	20	ASCII string	Null	1.00	Contains name of 5th highest priority alarm, displayed in 5th line of Alarm Browsing screen.
55	Alarm Priority 6	R/O	System	String20	20	ASCII string	Null	1.00	Contains name of 6th highest priority alarm, displayed in 6th line of Alarm Browsing screen.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
56	Power Failure Alarm Action	R/W	User	UINT8	1	0 → 4	4	1.00	Selects the response to a power failure condition. This issues a Power Failure alarm. Valid values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit
57	Last Power Down Time	R/O	System	Time	4	Any valid time	0	1.00	Stores previous power down time for a Power Failure alarm. This is a copy of the Last Power-Down Time in system (91,0,47). If the values of both of these parameters do not match the system issues a Power Failure alarm.
58	Alarm Output 1	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	Sets the TLP for Alarm output contact 1. This output activates when the Current Alarm Type (63,0,64) is equal to or greater than severity 3 (Display, stop batch, & close contact).
59	Blend Current Flowrate	R/O	System	Float	4	0.0 to any positive valid IEEE 754 float	0	1.00	Provides the blend's current flowrate (based on Preset Delivery Type [63,0,29] configured) when the batch is in progress. For **sequential** blending, this value is the same as flowrate of the current stream as read from liquid turbine point type. For **inline** blending, this value is the summation of flowrates of all active streams. For **in-line blending**, it is the sum of all flowrates of all wild streams.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
60	New Additive Selection Bitmap	R/W	KD/TA System	UINT16	2	Any valid value	32768	1.00	Enables you to enter new additive selection. Batching user program resets it to its default value after reading it. The new value is accepted when transaction is not authorized and will copy the same to Additive selection bitmap (63,0,112). It is used when Additive Selection Method (63,0,102) is using discrete input, keypad display, or TAS. **Note**: The value 32768 is a special case which indicates that additive selection is not done.
61	Stop Key Action	R/W	User	UINT8	1	0 → 1	0	1.00	Indicates the action resulting from pressing Stop. Valid values are: 0 = Low Flow (Reduce to low flow before stopping). 1 = Immediate (Stop immediately).
62	RESERVED								Reserved for future use
63	Seq Comp or Inline Blend Target Flowrate	R/O	System	Float	4	0.0 to any positive valid IEEE 754 float	0	1.00	Sets the target flowrate to be reached. For **sequential blending**, it sets the target flowrate to be reached. For **inline blending**, it sets the target flowrate of the blend as the sum of target flowrates of all streams. **Note**: This target flowrate always represents the indicated type of flowrate.
64	Current Alarm Type	R/O	System	UINT8	1	0 → 4	0	1.00	Defines the severity (action taken) of the highest severity active alarm. 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
65	Circuit1 Alarm Action	R/W	User	UINT8	1	0 → 4	3	1.00	Defines the severity (action taken) if the Safety Circuit 1 (63,0,85) alarm occurs. Value values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit
66	Alarm Message 1	R/W	User	String20	20	ASCII String	"Ground det. open"	1.00	Sets the alarm message for safety circuit 1.
67	Circuit2 Alarm Action	R/W	User	UINT8	1	0 → 4	3	1.00	Defines the severity (action taken) if the Safety Circuit 2 (63,0,86) alarm occurs. Valid values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit
68	Alarm Message 2	R/W	User	String20	20	ASCII String	"Overspill det. open"	1.00	Sets the alarm message for safety circuit 2.
69	Circuit3 Alarm Action	R/W	User	UINT8	1	0 → 4	3	1.00	Defines the severity (action taken) if the Safety Circuit 3 (63,0,87) alarm occurs. Valid values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit
70	Alarm Message 3	R/W	User	String20	20	ASCII String	"Permissive power fail"	1.00	Sets the alarm message for safety circuit 3.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
71	Circuit4 Alarm Action	R/W	User	UINT8	1	0 → 4	3	1.00	Defines the severity (action taken) if the Safety Circuit 4 (63,0,88) alarm occurs. Valid values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit
72	Alarm Message 4	R/W	User	String20	20	ASCII String	"Additive inject fail"	1.00	Sets the alarm message for safety circuit 4.
73	Circuit5 Alarm Action	R/W	User	UINT8	1	0 → 4	3	1.00	Defines the severity (action taken) if the Safety Circuit 5 (63,0,89) alarm occurs. Valid values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit
74	Alarm Message 5	R/W	User	String20	20	ASCII String	"Arm down side 1"	1.00	Sets the alarm message for safety circuit 5.
75	Circuit6 Alarm Action	R/W	User	UINT8	1	0 → 4	3	1.00	Defines the severity (action taken) if the Safety Circuit 6 (63,0,90) alarm occurs. Valid values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit
76	Alarm Message 6	R/W	User	String20	20	ASCII String	"Arm down side 2"	1.00	Sets the alarm message for safety circuit 6.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
77	Circuit7 Alarm Action	R/W	User	UINT8	1	$0 \rightarrow 4$	3	1.00	Defines the severity (action taken) if the Safety Circuit 7 (63,0,91) alarm occurs. Valid values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit
78	Alarm Message 7	R/W	User	String20	20	ASCII String	"Walkway dwn side 1"	1.00	Sets the alarm message for safety circuit 7.
79	Circuit8 Alarm Action	R/W	User	UINT8	1	$0 \rightarrow 4$	3	1.00	Defines the severity (action taken) if the Safety Circuit 8 (63,0,92) alarm occurs. Valid values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit
80	Alarm Message 8	R/W	User	String20	20	ASCII String	"Walkway dwn side 2"	1.00	Sets the alarm message for safety circuit 8.
81	Circuit 5 Type	R/W	User	UINT8	1	$0 \rightarrow 2$	1	2.00	Assigns the side for safety circuit number 5. Swing arm position inputs determine the side. Valid values are: 0 = Side independent 1 = Enabled only if loading at side 1 2 = Enabled only if loading at side 2
82	Circuit 6 Type	R/W	User	UINT8	1	$0 \rightarrow 2$	2	2.00	Assigns the side for safety circuit number 6. Swing arm position inputs determine the side. Valid values are: 0 = Side independent 1 = Enabled only if loading at side 1 2 = Enabled only if loading at side 2
83	Circuit 7 Type	R/W	User	UINT8	1	$0 \rightarrow 2$	1	2.00	Assigns the side for safety circuit number 7. Swing arm position inputs determine the side. Valid values are: 0 = Side independent 1 = Enabled only if loading at side 1 2 = Enabled only if loading at side 2

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
84	Circuit 8 Type	R/W	User	UINT8	1	0 → 2	2	2.00	Assigns the side for safety circuit number 8. Swing arm position inputs determine the side. Valid values are: 0 = Side independent 1 = Enabled only if loading at side 1 2 = Enabled only if loading at side 2
85	Safety circuit 1	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	Sets the input for safety circuit 1. The system updates the state of this input in Safety Circuit Status (63,0.98). **Note**: This should be the TLP in the ACIO or DI point type with data type of UINT8.
86	Safety circuit 2	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	Sets the input for safety circuit 2. The system updates the state of this input in Safety Circuit Status (63,0.98). **Note**: This should be the TLP in the ACIO or DI point type with data type of UINT8.
87	Safety circuit 3	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	Sets the input for safety circuit 3. The system updates the state of this input in Safety Circuit Status (63,0.98). **Note**: This should be the TLP in the ACIO or DI point type with data type of UINT8.
88	Safety circuit 4	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	Sets the input for safety circuit 4. The system updates the state of this input in Safety Circuit Status (63,0.98). **Note**: This should be the TLP in the ACIO or DI point type with data type of UINT8.
89	Safety circuit 5	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	Sets the input for safety circuit 5. The system updates the state of this input in Safety Circuit Status (63,0.98). **Note**: This should be the TLP in the ACIO or DI point type with data type of UINT8.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
90	Safety circuit 6	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	Sets the input for safety circuit 6. The system updates the state of this input in Safety Circuit Status (63,0.98). **Note**: This should be the TLP in the ACIO or DI point type with data type of UINT8.
91	Safety circuit 7	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	Sets the input for safety circuit 7. The system updates the state of this input in Safety Circuit Status (63,0.98). **Note**: This should be the TLP in the ACIO or DI point type with data type of UINT8.
92	Safety circuit 8	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	Sets the input for safety circuit 8. The system updates the state of this input in Safety Circuit Status (63,0.98). **Note**: This should be the TLP in the ACIO or DI point type with data type of UINT8.
93	Clean Line Quantity	R/W	User	UINT16	2	0 → 9999	0	1.00	Defines the quantity of the primary component to load at the end of the batch delivery to purge the blend from the loading lines. For a particular batch, if the preset quantity is less than or equal to the clean line quantity, the batch is delivered as if there were no clean line quantity configured. The flush is derived from batch Preset Quantity (63,0,39).'
94	Tolerance Allowed	R/W	User	UINT8	1	0 → 1	1	1.00	Defines whether blend ratio needs to be checked after adjustment for flush. If set to 0 (No), then blend ratio is checked after flush adjustment before starting a new batch. If blend ratio check fails, the batch cannot be started. It will also check the blend ratio at the end of batch. Valid values are: 0 = No (blend ratio checked before batching and at the end of batch) 1 = Yes

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
95	Error Code	R/O	System	UINT8	1	0 → 255	0	1.00	Shows the error code that sets on failure of recipe verification or preset verification. Valid values are: 0 = No error; KD reads the value and displays the intended message. **Note**: For a complete list of error codes, see *Section D.12, Error Codes*, in *Appendix D Communications Protocols,* of the *DL8000 Preset Instruction Manual* (A6212).
96	Seq Comp or Inline Blend Current Zone	R/O	System	UINT8	1	0 → 4	0	1.00	Defines the current flow zone for any component in a sequential batch. It also indicates the current state of blend for an inline batch. Valid values are: 0 = Low flow start 1 = High flow 2 = Low flow stop 3 = Lock 4 = Final Stop (i.e., normal stop)
97	Seq Comp Flowrate Error Limit	R/O	System	Float	4	0.0 to any positive valid IEEE 754 float	0	1.00	Shows the current flowrate error limit for the component in a sequential batch (where Unit Type (63,0,12) is 0 or 1. **Note**: This tolerance band flowrate is always of indicated flowrate type (and same as set in PID in case of digital valve).

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
98	Safety Circuit Status	R/O	System	UINT8	1	0 → 255	0	1.00	Shows the status of all safety circuit inputs. The system updates this value regardless of the configured safety alarm actions. Each bit starting from LSB (bit 0 for safety circuit 1, bit 1 for safety circuit 2, etc.) indicates the state of a safety circuit input. If the value of the bit for a safety circuit is 0, it means that safety circuit ins in an unsafe state [0]. If the safety circuit is not configured, then the value of the bit for respective safety circuit will be equal to safe state [1]. 0 = All safety circuit inputs in unsafe condition 255 = All safety circuit inputs in safe condition.
99	Current Component ID	R/O	System	UINT8	1	1 → 4	1	1.00	Shows the current component number in progress in a sequential batch. Valid values range from 1 to Number of Comp (63,0,21) whose recipe component ratio is non-zero. For **sequential blending**, this indicates the current component being delivered. **Note**: Used **only** for sequential blending.
100	No. of Additives	R/W	User	UINT8	1	0 → 10	0	1.00	Sets the number of additives used in the system.
101	Additive Units	R/W_ CNDL	User	UINT8	1	0 → 6	0	1.00	Defines the external unit for additives. Valid values are: 0 = CC (cubic centimeter) 1 = INCH3 (cubic inches) 2 = Gallons (US) 3 = Liters 4 = Barrels 5 = FT3 (cubic feet) 6 = M3 (cubic meter)

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
102	Additive Selection Method	R/W	User	UINT8	1	0 → 4	1	1.00	Defines the selection method for additives. Valid values are: 0 = External (not currently supported) 1 = Prompt 2 = Discrete inputs 3 = Recipe selection 4 = Recipe selection with Multi rate
103	Additive Error Limit	R/W	User	UINT8	1	0 → 99	3	1.00	Defines the maximum number of pulses by which actual feedback pulse count can differ from ideal count before Additive Fail # alarm is raised.
104	Additive Clean Line Quantity	R/W	User	UINT16	2	0 → 9999	0	1.00	Defines quantity of product to be delivered at the end of batch or at end of component without additive injection. This is done so that the next component or batch is not contaminated with the previous batch's additive. This value should be at least as large as the volume of the pipe and loading arm between the point where additive is injected and the connection to the vehicle.
105	Additive Flush Output	R/W	User	TLP	3	DO/ACIO TLP	0,0,0	1.00	Defines the output contact TLP which is made active during the delivery of clean line quantity at the end of batch delivery. This output is intended for use in multi-stream injection mode, but is available independently of the injection mode. This activates 10 units after clean line output (63,0,107) actives. Consequently, the Additive Clean Line Quantity (63,0,104) should be greater than 10 product units when using the additive flush output. **Note**: This parameter should point to ACIO or DO point type status parameter with a UINT data type.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
106	Additive Pump Stop Delay(s)	R/W	User	UINT8	1	0 → 99	0	1.00	Defines value, in seconds, after which additive pump output deactivates after receiving End of the Batch or Batch Halted command from the batching user program.
107	Additive Clean Line Output	R/W	User	TLP	3	DO/ACIO TLP	0,0,0	1.00	Defines the output contact TLP which activates during the delivery of Additive Clean Line Quantity (63,0,104) at the end of batch delivery .A typical use for this output is to connect the clean line volume to a smart (microprocessor controlled) additive injector that over-injects at the start of a batch and stops injecting prior to the end of the batch. Another use is with a multi-stream injector where the additive clean line output should be connected to the block valve that allows product to flow to the (shared) additive ratio solenoid. **Note**: The parameter should point to ACIO or DO point type status parameter with data type as UINT8.

108	Additive Alarm Bitmap	R/O	System	UINT8	1	0 → 63	0	1.22	Sets alarm status of each of the six possible additives for Additive Fail # alarm. LSB bit 0 indicates status of additive #1, bit 5 for additive #6. Valid values are:
									1 = Alarm active
									0 = Alarm inactive
									Note: If the number of selected additives is greater than 6, the status appears in point type 64, parameter 60.

109	No of Points of Meter factor Linearization	R/W_ CNDL	User	UINT8	1	1 → 12	4	1.00	Sets the number of Flowrate Freq set points to be used at which the meter is calibrated and these can be used for fallback and recovery feature of flow control.
110	Low Flow Alarm Bitmap	R/O	System	UINT16	2	0 → 15	0	1.22	Shows alarm status for Low Flow Meter # alarm. One bit is used for each meter. When raised/cleared, respective bit is set to 1 or 0.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
111	Current Alarm ID	R/O	System	UINT8	1	0 → 255	255	1.22	Shows alarm ID of oldest priority active alarm. **Note**: Alarm IDs for additives 7, 8, 9, and 10 added in release 2.23 and above.
112	Additive Selection Bitmap	R/O	System	UINT16	2	0 → 32768	32768	1.00	Shows additive selection bitmap for methods using discrete input, keypad display, or TAS. **Note**: The value **32768** is a special case indicating that none of additives is selected.
113	RESERVED								Reserved for future use
114	User Program Config Status	R/W	System	UINT32	4	0 → 15	0	2.34	Sends configurations status message from other user programs to the batching user program. Bit values are: Bit 0 – Additive UP Config Corrupt Bit 1 – Additive UP Parameter Restored Bit 2 – Print UP Config Corrupt Bit 3 – Print UP Parameter Restored Bit 4 – History UP Config Corrupt Bit 5 – History UP Paramater Restored Bit 6 – Additve UP Config Changed Bit 7 – Print UP Config Changed Bit 8 – History UP Parameter Changed

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
115	Use Restart Qty	R/W	System	UINT8	1	0 → 1	0	1.00	Defines whether to use Low Flow Restart Quantity (Gross) (69,x,1) when restarting a halted batch or starting a new component for a sequential batch. Valid values are **0** (Yes) and **1** (No). System uses restart quantity if this field is **0** (Yes) and **either** the Current Component (63,0,7) is other than first component **or,** if restarting the first component, when first component restarts after delivering a quantity (based on Preset Delivery Type (63,0,29) more than 'Low Flow Start Quantity (Gross)' [69,x,0]. **Note**: Used **only** for a sequential batch.
116	High Flow Alarm Bitmap	R/O	System	UINT16	2	0 → 15	0	1.22	Shows alarm status for High Flow Meter # alarm. One bit is used for each meter, starting from LSB bit 0 for meter 1. When raised or cleared, respective bit is set to 1 or 0.
117	No Flow Alarm Bitmap	R/O	System	UINT16	2	0 → 15	0	1.22	Shows alarm status for No Flow Meter # alarm. One bit is used for each meter, starting from LSB bit 0 for meter 1. When raised or cleared, respective bit is set to 1 or 0.
118	New Recipe Selection	R/O	System	UINT8	1	1 → 30	1	1.00	Shows the number of the selected recipe. The operator enters the recipe at Recipe Selection (63,0,10) and the system copies the recipe number to this parameters. The copy occurs in **manual mode** if the transaction is not authorized and recipe verification passes. The copy occurs in **auto mode** if transaction is not authorized.
119	Status Flags	R/O	System	UINT32	4	0 → 4294967295	0	1.00	Shows a complete set of status flags; each flag represents one bit.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
120	Un Auth Flow Alarm Bitmap	R/O	System	UINT16	2	0 → 15	0	1.22	Shows alarm status for Unauthorized Flow Meter # alarm for all meters. One bit is used for each meter. When the alarm raises or clears, respective bit is set to 1 or 0.
121	Unable to Close Valve Alarm Bitmap	R/O	System	UINT16	2	0 → 15	0	1.22	Shows alarm status for Unable to Close Valve Meter # alarm. One bit is used for each meter. When the alarm raises or clears, respective bit is set to 1 or 0.
122	Under flow Alarm Bitmap	R/O	System	UINT16	2	0 → 15	0	1.22	Shows alarm status for Valve Closed Early (Underflow) Meter # alarm. One bit is used for each meter. When the alarm raises or clears, respective bit is set to 1 or 0.
123	Unable to Rampdown Alarm Bitmap	R/O	System	UINT16	2	0 → 15	0	1.22	Shows alarm status for Unable to Ramp Down Meter # alarm. One bit is used for each meter. When the alarm raises or clears, respective bit is set to 1 or 0.
124	Transaction Number	R/O	System	UINT16	2	0 → 9999	9999	1.00	Indicates (if **no** transaction is authorized) the transaction sequence number of the most recently ended transaction. If a transaction **is** authorized, indicates the transaction sequence number of the current transaction.
125	Batch Number	R/O	System	UINT16	2	0 → 9999	9999	1.00	Indicates (if **no** batch is authorized) the batch sequence number of the most recently ended batch. If a batch **is** authorized, indicates the batch sequence number of the current batch.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
126	Batches/Transaction	R/W	User	UINT16	2	0 → 10000	0	1.00	Defines the maximum number of batches per transaction. When an attempt is made to enter preset quantity and the maximum number of batches has already been loaded in the current transaction in progress, the DL8000 fails preset verification and displays an error message (63,0,95). **Note**: Set this value to **0** to indicate that the maximum number of executable batches is 10000.
127	End Output Method	R/W	User	UINT8	1	1 → 3	1	1.00	Configures whether system performs end output, end input, and end time processing only at the end of a batch, only at the end of a transaction, or both at the end of a batch and at the end of a transaction. Valid values are: 1 = "Ba only": Perform end output processing only at the end of a batch. 2 = "Tr only": Perform end output processing only at the end of a transaction. 3 = "Both": Perform end output processing both at the end of a batch and at the end of a transaction.
128	End Time(s)	R/W	User	UINT16	2	0 → 9999	180	1.00	Defines the maximum time, in seconds, for which end output remains energized for end of batch / transaction, depending on the configured end output method. *See description of end output for details.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
129	End Input	R/W	User	TLP	3	Any valid digital or ACIO input	0,0,0	1.00	Defines input status contact TLP used during end batch/transaction processing. This input is scanned to be in ON state after energizing the End Output (63,0,130) at the end of batch/transaction based on the configured End Output Method (63,0,127). If it is found to be in ON state then end output is de-energized. However if input remains in OFF state after End Time (63,0,128) elapses, then 'safety circuit 3' alarm is raised. This TLP should point to status parameter of ACIO or DI point type having U8 data type.
130	End Output	R/W	User	TLP	3	Any valid digital or ACIO output	0,0,0	1.00	Defines output status contact TLP used during end batch/transaction processing. If you configure End Output, it activates based on the configured End Output Method. It activates if End Input is not configured or if End Input is configured but not activated. End Output stays active until End Input is activated or until a Safety Circuit Alarm 3 raises. The system raises a Safety Circuit 3 alarm if the End Input does not activate within the time specified in End Time (63,0,128), a Safety Circuit 3 alarm raises. **Note**: If you set End Time to **0** (zero), then End Output stays active till End Input gets activates. Also, the system does not raise a Safety Circuit 3 alarm. This TLP should point to status parameter of ACIO or DO point type having U8 data type.
131	RESERVED								Reserved for future use

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
132	Avg Batch Temp (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.00	Indicates average batch temperature (FWA) value. It is calculated when the batch is in progress using the flow weighted average temperatures of all the components (69,0,61). It resets to zero when a new batch authorizes
133	Meter Authorization status	R/O	System	UINT16	2	0 → 1023	0	1.00	Shows the meter authorization status for each meter. Bit n indicates status for Meter number = n+1. If a bit sets, the meter is authorized. Meter remains authorized when flow control valve opens until it is next commanded to close either as flow becomes 0 or until any alarm with severity 2 or more raises.
134	Print Command	R/W	KD	UINT8	1	0 → 3	0	1.00	Issues a command to the printer user program to print a transaction ticket. Valid values are: 0 = No action 1 = Print old transaction from history 2 = Most recent transaction 3 = Print Weights & Measures Event Logs **Note**: After handling the command the parameter is set back to default value.
135	Gross Del Qty(Batch)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the gross volume delivered in batch
136	Print Transaction Number	R/W	KD	UINT16	2	0 → 10000	10000	1.00	Indicates the transaction number whose ticket should be printed from history and enables reprinting old transaction ticket from history. **Note**: If this parameter value is 10000, the latest transaction from the archive memory prints after receiving the Print command.
137	Net Std Del Qty(Batch)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Indicates net standard quantity delivered in the batch (when batch is in progress) or net standard quantity of previous batch (if batch is not in progress).

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
138	Mass Del Qty(Batch)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Indicates mass delivered in the batch (when batch is in progress) or net standard quantity of previous batch (if batch is not in progress).
139	Com Port 4	R/W	User	UINT8	1	0 → 4	0	1.00	Defines Com port 4. This port could be configured for the following applications. 0 = No Application. 1 = Modicon Modbus 2 = DL6000 Protocol. 3 = Brooks Protocol. (not currently supported) 4 = Data Logging/Print.
140	Gross Del Qty (Transaction)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Indicates gross volume delivered in the batch (when batch is in progress) or net standard quantity of previous batch (if batch is not in progress).
141	Avg Batch Pressure (FWA)	R/O	System	Float	4	0.0 to any positive valid IEEE 754 Float	0	1.00	Indicates average batch pressure (FWA) value. It is calculated when the batch is in progress using the flow weighted average pressure of all the components (69,x,72). It resets to zero when a new batch authorizes.
142	Net Std Del Qty (Transaction)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Indicates net standard volume delivered in the current transaction (when transaction is in progress) or net standard quantity of previous transaction (if transaction is not in progress).
143	Mass Del Qty (Transaction)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Indicates mass delivered in the current transaction (when transaction is in progress) or net standard quantity of previous transaction (if transaction is not in progress).
144	Roll Over Limit	R/O	System	Double	8	Any positive valid IEEE Double Precision Float	1E12	1.00	Shows the rollover limit for non-resettable totalizer. When totals reach this limit they reset to zero and begin incrementing again. This value is the same as that for free running totals maintained in the Liquid Calculations program.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
145	Swing Arm Current Side							1.00	
145	Swing Arm Current Side	R/O	System	UINT16	2	0 → 2	1	2.00	Indicates the current side of product loading swing arm based on Side Detect Method (64,0,6) and status of switches configured in Swing 1 Input (64,0,8) and Swing 2 Input (64,0,9). Valid values are: 0 = Parked state 1 =Side 1 2 =Side 2 **Note**: The system updates Current Swing Arm Side (63,0,145) continuously every 2 seconds. However it is checked only at the time of starting a newly authorized batch and restart of a halted batch. It is also updated when any DanLoad 6000 command [0x10, 0x12, 0x1F, 0x33, 0x3C] requesting the current side is received.I.
146	System Alarm Action	R/W_ CNDL	User	UINT8	1	0 → 4	4	1.00	Defines the severity (action taken) when the alarm is raised. Valid values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit
147	Active Component	R/O	System	UINT8	1	0 → 15	0	1.00	Indicates component authorized state for all components. This parameter is set in all types of blending. Each bit represents one component and bit status indicates component state. Bit n indicates status for Comp no = n+1. If bit value is 1 then component is active (authorized and being delivered). Note: It starts from least significant bit. Bit 0 ->COMP1, Bit 1 -> COMP2 so on).

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
148	Blend Tolerance Percentage	R/W	User	Float	4	0.000 → 99.999	5	1.00	Defines the blend ratio tolerance allowed during following checks: 1. To check the blend ratio after making adjustment for flush component before starting the new batch. System checks for blend tolerance if you set Tolerance Allowed (63,0,94) as NO. 2. To check blend ratio at the end of batch for raising unable to maintain blend alarm to check the percentage deviation of component after delivery. 3. To check blend ratio during the delivery of inline batch at high flowrate It is used to raise instantaneous blend ratio alarm.
149	Com Port 5	R/W	User	UINT8	1	0 → 4	0	1.00	Defines Com port 5. You can configure this port for the following applications. 0 = No Application. 1 = Modicon Modbus 2 = DL6000 Protocol. 3 = Brooks Protocol. (not currently available) 4 = Data Logging/Print.
150	RESERVED								Reserved for future use
151	Density/Gravity Scale	R/W	User	UINT16	2	1 → 4	4	1.20	Divides density values coming from TAS and multiplies density values when sending to TAS. **Note**: This is used for DanLoad 6000 protocol.
152	Time-out ch. Comm Port 2	R/W	User	UINT16	2	0 → 300	10	1.00	Defines, in seconds, a time-out period for the comm 2 port. If after this time the system does not receive a valid frame on the communication port 2, it raises a Comm Fail 2 alarm. **Note**: Enter 0 (zero) in this parameter to disable the primary alarm for this port.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
153	Time-out ch. Comm Port 3	R/W	User	UINT16	2	0 → 300	10	1.00	Defines, in seconds, a time-out period for the comm 3 port. If after this time the system does not receive a valid frame on the communication port 3, it raises a Comm Fail 3 alarm. **Note**: Enter 0 (zero) in this parameter to disable the primary alarm for this port.
154	Time-out ch. Comm Port 4	R/W	User	UINT16	2	0 → 300	10	1.00	Defines, in seconds, a time-out period for the comm 4 port. If after this time the system does not receive a valid frame on the communication port 4, it raises a Comm Fail 4 alarm. **Note**: Enter 0 (zero) in this parameter to disable the primary alarm for this port.
155	Time-out ch. Comm Port 5	R/W	User	UINT16	2	0 → 300	10	1.00	Defines, in seconds, a time-out period for the comm 5 port. If after this time the system does not receive a valid frame on the communication port 5, it raises a Comm Fail 5 alarm. **Note**: Enter 0 (zero) in this parameter to disable the primary alarm for this port.
156	Comm Fail alarm bitmap	R/O	System	UINT8	1	0 → 63	0	1.00	Indicates the status of each of the four possible (ports 2 to 5) Comm Fail alarms.
157	Minimum component temperature	R/W_ CNDL	User	Float	4	–999.9 to 999.9	–40	2.34	Sets the minimum allowable component temperature. When the component's current temperature (73,0,25) drops below this value, the system raises the Temperature Fail Meter # alarm.
158	Maximum component temperature	R/W_ CNDL	User	Float	4	–999.9 to 999.9	110	2.34	Sets the maximum allowable component temperature. When the component's current temperature (73,0,25) rises above this value, the system raises the Temperature Fail Meter # alarm.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
159	Temp fail alarm bitmap	R/O	System	UINT16	2	0 → 15	0	1.22	Indicates alarm status for Temperature Fail Meter # alarm for all meters. One bit is used for each meter. When the alarm is raised/cleared, the respective bit is set to 1 or 0.
160	Minimum component pressure	R/W_ CNDL	User	Float	4	0.0 to 9999.99	0	2.34	Sets the minimum allowable component pressure. When the component's current pressure (73,0,24) falls below this value, the system raises the Pressure Fail Meter # alarm.
161	Maximum component pressure	R/W_ CNDL	User	Float	4	0.0 to 9999.99	0	2.34	Sets the maximum allowable component pressure. When the component's current pressure (73,0,24) rises above this value, the system raises the Pressure Fail Meter # alarm.
162	Pressure fail alarm bitmap	R/O	System	UINT16	2	0 → 15	0	1.22	Indicates alarm status for the Pressure Fail Meter # alarm. One bit is used for each meter. When the alarm is raised/cleared, the respective bit is set to 1 or 0.
163	Minimum component density	R/W	User	Float	4	–9999.9 to 9999.9	-9999.9	1.22	Sets the maximum allowable component density. When the component's current density (73,0,18) rises above this value, the system raises the Density Fail Comp # alarm.
164	Maximum component density	R/W	User	Float	4	–9999.9 to 9999.9	9999.9	1.22	Sets the minimum allowable component density. When the component's current density (73,0,18) falls below this value, the system raises the Density Fail Comp # alarm.
165	Density fail alarm bitmap	R/O	System	UINT16	2	0 → 15	0	1.00	Indicates alarm status for Density Fail Comp # alarm. One bit is used for each component, starting from LSB bit 0. When raised/cleared, the respective bit is set to 1 or 0.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
166	TA command	R/W	Batching/Modbus	UINT8	1	Valid TA command	0	1.00	Writes a new TA command. In **automatic mode**, the system accepts **all** commands received from the TAS. In **manual mode**, only **some** TAS commands are accepted. The TA writes the new TA command to this parameter. The Batching user program copies this parameter to New TA Command (63,0,67) and resets this parameter to 0 to accept new TA command. Batching user program then executes the command and write the exception code (63,0,68). Refer to *Appendix F* for list of all supported command codes.
167	New TA command	R/O	System	UINT8	1	Valid TA command	0	1.00	Shows a backup copy of TA Command (63,0,166). The system keeps a copy of TA Command to raise TLP change event at TA command parameter.
168	TA exception code	R/O	System	UINT8	1	Any valid value	0	1.22	Shows exceptions raised during execution of latest TAS command. The Batching user program completes this parameter with the exception code after execution of each TA command received at New TA Command (63,0,67). The TAS reads this to read the result of execute commands. **Note**: A value of 255 means no exception is raised (that is, the command executed successfully). Refer to *Appendix F* for list of all supported command codes.
169	RESERVED								Reserved for future use

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
170	Suggested Additive by TA	R/W	User	UINT16	2	0 → 63	0	1.00	Indicates the TAS-provided additive selection bitmap, used in the following TA commands: 1. Prompt Additive (where suggested additives are displayed as selected in select additive screen of keypad display) 2. Authorize Transaction (where TA can force additive selection bitmap (63,0,112) by making this 0. TAS can also allow to select the additives according to the configured Additive Selection Method [63,0,102] by making this as 1.
171	Operation timeout	R/W	TA/ System	UINT16	2	0 → 65535	0	1.00	Defines, in seconds, how long the TAS waits before timing out. Use this parameter with TA commands that require the operator to answer a prompt. If the operator does not perform any selection within this time then active screen times out. **Note**: Used with the TAS.
172	Copy status	R/W	TA/ System	UINT32	4	0 → 4294967295	0	1.00	Provides a copy of Status Flags (63,0,119). The TAS completes this field and uses it in the Clear Status TA command to clear certain status flags.
173	Reset alarm id	R/W	TA/ System	UINT8	1	0 → 255	255	1.00	Indicates a TA-provided alarm ID. The TA system uses it for the Reset Primary Alarm and Report Alarm TA commands. The DL8000 reads the alarm ID from this TLP and executes the command.
174	TA set time	R/W	TA/ System	TIME	4	Any valid time	0	1.00	Indicates a TA-provided value. The TAS uses this value in the Set Date and Time command to set the clock time in the DL8000. Time is number of seconds elapsed since 12 AM. Jan 01, 1970.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
175	TA display data	R/W	TA/ System	String20	20	Any string of length 20	"Not configure"	1.00	Indicates the string shown on the keypad display. The TAS writes this parameter to specify the string shown on keypad-display and then issues a Display Message command to display this string on keypad.
176	Prompt width	R/W	TA/ System	UINT8	1	0 → 20	0	1.00	Specifies the width of the prompt for the Display Message command. The TAS writes this parameter and issues the Display Message command.
177	Keypad Data	R/W	KD	UINT32	4	0 → 99999999	100000000	1.00	Stores a value the operator enters in response to a screen prompt after receiving Display Message command with Auxiliary Data Index equal to 0 from TA system. **Note**: Default value of **100000000** is required to provide TLP change event to user program on this parameter.
178	Auxiliary Data Index	R/W	TA/ System	UINT8	1	0 → 5	0	1.00	Indicates an auxiliary data index. This parameter is used with Display Message command. If Display Message command is received from TA and index is non zero and transaction is not authorized, then required auxiliary screen displays. If index is zero then it should consider simple display message command which can be used to prompt fill of any authorized batch.
179	Avg Batch Base Density (FWA)	R/O	System	Float	4	Any valid IEEE 754 float	0	1.00	Indicates average batch base density (FWA) value. The system calculates this value when the batch is in progress using the flow-weighted average base densities of all components (69,0,100). The system resets this value to zero when a new batch is authorized.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
180	TA operating mode	R/W	User	UINT8	1	0 → 1	1	1.00	Indicates a TA-provided parameter that specifies the new operating mode prior to issuing a Change Operating Mode command. Valid values are: 0 = Auto 1 = Manual

181	Temperature Fail Alarm Action	R/W_ CNDL	User	UINT8	1	0 → 4	4	2.34	Defines the severity (action taken) when the Temperature Failure Meter # alarm is raised. Valid values are:
									0 = Off
									1 = Info
									2 = Info & stop batch
									3 = Info, stop batch, & close contact
									4 = Info, stop batch, close contact, & lock unit.

182	Pressure Fail Alarm Action	R/W_ CNDL	User	UINT8	1	0 → 4	4	2.34	Defines the severity (action taken) when the Pressure Failure Meter # alarm is raised. Valid values are:
									0 = Off
									1 = Info
									2 = Info & stop batch
									3 = Info, stop batch, & close contact
									4 = Info, stop batch, close contact, & lock unit.

183	Density Fail Alarm Action	R/W	User	UINT8	1	0 → 4	4	1.00	Defines the severity (action taken) when the Density Failure Meter # alarm is raised. Valid values are:
									0 = Off
									1 = Info
									2 = Info & stop batch
									3 = Info, stop batch, & close contact
									4 = Info, stop batch, close contact, & lock unit.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
184	Additive Error Limit (Control)	R/W	User	UINT8	1	1 → 99	1	2.00	Defines, for the Meter and Control injection methods, the number of injection cycles worth of additive (that is, ideal doses of additive) by which the actual volume of additive can differ from the ideal volume of additive at any point in a batch before the percentages are checked for the purpose of raising an Additive Fail # alarm.
185	Suggested Preset Volume	R/W	TA/ System	Float	4	0.0 to any positive valid IEEE 754 float	0	1.00	Indicates the suggested preset quantity, used to get the operator input on preset quantity. The TAS writes this value before issuing a Prompt Preset Volume command.
186	Number of data items	R/W	User	UINT8	1	0 → 5	0	1.00	Defines the number of data items the DL8000 supports. It is used to get the data items in manual operating mode before authorizing a new transaction. Data items are used for transaction ticket printing and archiving for each transaction. In **auto operating** mode, the TAS issues a Display Message command with Auxiliary Data Index (63,0,178) set as 1 to Number of Data Items to get the auxiliary data inputs from the operator. System stores data items at (63,0,188; 63,0,190; 63,0,192; 63,0,194; and 63,0,196)
187	Data prompt 1	R/W	User	String20	20	Any ASCII string	Enter data item #1	1.00	Defines the string for first data prompt used prior to authorizing transaction.
188	Data item 1	R/W	User	UINT32	4	0 → 4294967295	4294967295	1.00	Defines the first data item selected for current transaction. **Note**: Default value of **4294967295** is required to provide the TLP change event to the user program.
189	Data prompt 2	R/W	User	String20	20	Any valid string	Enter data item #2	1.00	Defines the string for second data prompt used prior to authorizing transaction.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
190	Data item 2	R/W	KD/ System	UINT32	4	0 → 4294967295	429496729 5	1.22	Defines the second data item selected for current transaction. **Note**: Default value of **4294967295** is required to provide the TLP change event to the user program.
191	Data prompt 3	R/W	User	String20	20	Any valid string	Enter data item #3	1.00	Defines the string for third data prompt used prior to authorizing transaction.
192	Data item 3	R/W	KD/ System	UINT32	4	0 → 4294967295	429496729 5	1.22	Defines a third data item selected for current transaction. **Note**: Default value of **4294967295** is required to provide the TLP change event to the user program.
193	Data prompt 4	R/W	User	String20	20	Any valid string	Enter data item #4	1.00	Defines a string for fourth data prompt used prior to authorizing transaction.
194	Data item 4	R/W	KD/ System	UINT32	4	0 → 4294967295	429496729 5	1.22	Defines a fourth data item selected for current transaction. **Note**: Default value of **4294967295** is required to provide the TLP change event to the user program.
195	Data prompt 5	R/W	User	String20	20	Any valid string	Enter data item #5	1.00	Defines a string for fifth data prompt used prior to authorizing transaction.
196	Data item 5	R/W	KD/ System	UINT32	4	0 → 4294967295	429496729 5	1.22	Defines a fifth data item selected for current transaction. **Note**: Default value of **4294967295** is required to provide the TLP change event to the user program.
197	Blend Low Flow Start Quantity (Gross)	R/W	User	UINT32	4	0 → 99,999	50	1.00	Defines the low flow start quantity (gross) for inline blend when the DL8000 switches blend to high flow zone (as it ramps up high proportion streams to high flowrate and starts delivery of low proportion streams).
198	Gross Unauthorized Transaction Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Indicates the gross volume delivered since the end of previous transaction when any meter was in un-authorized state (63,0,133).

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
199	Net Unauthorized Transaction Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Indicates the net standard. volume delivered since the end of previous transaction when any meter was in un-authorized state (63,0,133).
200	Mass Unauthorized Transaction Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Indicates the mass delivered since the end of previous transaction when any meter was in un-authorized state (63,0,133).
201	Out of range Parameter 1	R/O	System	TLP	3	Any valid TLP	0,0,0	1.00	Contains the TLP value of the first out-of-range parameter being viewed in the current page of corrupt parameters. The system raises a Config Corrupt alarm if it finds any configuration parameter holding a corrupt value. You can display six out-of-range parameters at a time. Use the scroll up/down keys to browse next or previous pages.
202	Out of range Parameter 2	R/O	System	TLP	3	Any valid TLP	0,0,0	1.00	Contains the TLP value of the second out-of-range parameter being viewed in the current page of corrupt parameters. The system raises a Config Corrupt alarm if it finds any configuration parameter holding a corrupt value. You can display six out-of-range parameters at a time. Use the scroll up/down keys to browse next or previous pages.
203	Out of range Parameter 3	R/O	System	TLP	3	Any valid TLP	0,0,0	1.00	Contains the TLP value of the third out-of-range parameter being viewed in the current page of corrupt parameters. The system raises a Config Corrupt alarm if it finds any configuration parameter holding a corrupt value. You can display six out-of-range parameters at a time. Use the scroll up/down keys to browse next or previous pages.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
204	Out of range Parameter 4	R/O	System	TLP	3	Any valid TLP	0,0,0	1.00	Contains the TLP value of the fourth out-of-range parameter being viewed in the current page of corrupt parameters. The system raises a Config Corrupt alarm if it finds any configuration parameter holding a corrupt value. You can display six out-of-range parameters at a time. Use the scroll up/down keys to browse next or previous pages.
205	Out of range Parameter 5	R/O	System	TLP	3	Any valid TLP	0,0,0	1.00	Contains the TLP value of the fifth out-of-range parameter being viewed in the current page of corrupt parameters. The system raises a Config Corrupt alarm if it finds any configuration parameter holding a corrupt value. You can display six out-of-range parameters at a time. Use the scroll up/down keys to browse next or previous pages.
206	Out of range Parameter 6	R/O	System	TLP	3	Any valid TLP	0,0,0	1.00	Contains the TLP value of the sixth out-of-range parameter being viewed in the current page of corrupt parameters. The system raises a Config Corrupt alarm if it finds any configuration parameter holding a corrupt value. You can display six out-of-range parameters at a time. Use the scroll up/down keys to browse next or previous pages.
207	Param restored alarm auto reset time	R/W	User	UINT16	2	$1 \rightarrow 65{,}535$	300	1.00	Defines, in seconds, the time after which the Parameter Restored alarm (info type) automatically resets.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
208	Restore reason code	R/O	System	UINT8	1	Any valid value	0	1.00	Indicates the reason a parameter has been restored. This parameter sets when any configuration parameter resets to its previous value. Valid values are: 0 = Parameter not restored 1 = LOT (Lock on transaction) 2 = LOB (Lock on Batch auth or progress) 3 = LOP (Lock on Primary alarm) 4 = MAX (greater than max value) 5 = MIN (less than minimum value) 6 = NOL (Not in List) 7 = NPC (Non printable character) 8 = Value is not valid DO 9 = Value is not valid DI 10 = Value is more than logicals, 11 = Invalid value (reason code used for any of the reasons not specified above)
209	Maximum permissible meter factor deviation	R/W_ CNDL	System/KD	Float	4	0.0 → 9.999	0.5	2.34	Sets the maximum permissible deviation between adjacent meter factors. Otherwise Meter Factor Deviation alarm is raised.
210	RESERVED								Reserved for future use
211	Maximum fallback allowed	R/W	User	UINT8	1	0 → 15	4	1.00	Sets the maximum number of levels through which a stream can fall back. **Note**: Used for inline batches.
212	Correction after quantity	R/W	User	UINT16	2	0 → 9999	100	1.00	Defines gross volume of blend delivered since the start or restart of a batch. After this value is delivered, the system checks the blend ratio for Internal Error Limit (63,0,213) or Max Deviation Volume (63,0,248), according to the configured Blend Error Method (63,0,247) for making blend adjustments if any stream has error more than inner error. Also the blend current zone (63,0, 96) should be high flow zone, in which checks for instantaneous blend deviation occur. Max Deviation Volume is currently not supported.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
213	Internal error limit	R/W	User	UINT8	1	0 → 20	2	1.00	Defines, as a percentage, an error limit or a maximum blend error/deviation. If the current blend deviation percentage of any stream is more than this limit for configurable time then the system performs a blend adjustment. This error is used for Blend Error Method (63,0,247) is 0/1/2/5/6.
214	Instant Blend Alarm Delay(s)	R/W	User	UINT16	2	0 → 999	5	1.00	Defines, in seconds, how long a stream's blend error/deviation percentage can be continuously more than the value set in Blend Tolerance Percentage (63,0,148) **or** how long the error volume can be more than Blend Tolerance Quantity (based on the configured Blend Error Method [63,0,247]) before the system raises an Instant Blend alarm. The timer for this duration starts when deviation is more than the Blend Tolerance Percentage. This timer stops if the deviation is less than or equal to the Blend Tolerance Percentage. When this timer expires the system raises an Instant Blend alarm.
215	Blend Control Delay(s)	R/W	User	UINT16	2	0 → 999	5	1.00	Defines, in seconds, the duration for which **either** a blend error/deviation percentage for any stream can be continuously more than Internal Error Limit (63,0,213) **or** an error volume can be more than Max Deviation Volume (63,0,248) (based on the configured Blend Error Method [63,0,247]) before the system makes a blend ratio adjustment.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
216	Blend Adjustment Volume	R/W	User	UINT16	2	0 → 9999	50	1.00	Defines the blend adjustment quantity based on the configured Preset Delivery Type (63,0,29). The system uses this value to calculate the blend adjustment window during which blend corrections should finish. If a blend has not crossed the 50% of the calculated adjustment window, the next adjustment is not started. This window should be sufficient enough to avoid repeated adjustment and allow sufficient time for streams to achieve the new adjusted target flowrates and correct blend ratios. This window also determines the adjustment target flowrates that will be calculated at the time of blend ratio adjustment. **Note**: This volume is delivered only by high proportion streams.
217	Blend Alarm After Qty	R/W	User	UINT16	2	0 → 9999	200	1.00	Defines the gross volume of blend to be delivered following the batch start/restart. After this volume is delivered, the system checks the blend ratio for Blend Tolerance Percentage (63,0,148) or blend tolerance qty (based on the configured Blend Error Method [63,0,247]) and raises the Instant Blend alarm if any stream has error more than outer error. **Note**: The blend current zone should be in the high flow zone where instantaneous blend deviation is checked.

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
218	Instant Blend Alarm Action	R/W	User	UINT8	1	0 → 4	4	1.00	Defines the severity (action taken) when the Instant Blend Comp #' alarm is raised. Valid values are : 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit

219	Linearization Alarm Action	RW_ CNDL	User	UINT8	1	0 → 4	0	1.00	Defines the severity (action taken) when the Linearization Comp # alarm is raised. Valid values are:
									0 = Off
									1 = Display
									2 = Display & stop batch
									3 = Display, stop batch, & close contact
									4 = Display, stop batch, close contact, & lock unit

220	Valve Fail Alarm Action	R/W	User	UINT8	1	0 → 4	4	1.00	Defines the severity (action taken) when the Valve Failure Meter # alarm is raised. Valid values are:
									0 = Off
									1 = Display
									2 = Display & stop batch
									3 = Display, stop batch, & close contact
									4 = Display, stop batch, close contact, & lock unit

221	Valve close Time(s)	R/W	User	UINT8	1	1 → 99	5	1.00	Defines, in seconds, the time between the issuing of the command to close the valve and the batch stopping (due to any alarm or user stop). If during this time the flowrate through the associated meter does not reduce to zero then the system raises a Valve Fail Meter #' alarm if the Valve Fail Alarm Action (63,0,220) is not **0** (Off).
222	Valve fail alarm bitmap	R/O	System	UINT16	2	0 → 15	0	1.22	Shows the alarm status for Valve Fail Meter # alarm. One bit is used for each meter. When raised/cleared, the respective bit is set to 1 or 0.

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values

223	Meter factor deviation alarm action	R/W_ CNDL	User	UINT8	1	0 → 4	4	1.00	Defines the severity (action taken) when the Meter Factor Deviation Comp # alarm is raised. Valid values are:
									0 = Off
									1 = Display
									2 = Display & stop batch
									3 = Display, stop batch, & close contact
									4 = Display, stop batch, close contact, & lock unit

224	Temperature drift alarm action	R/W	User	UINT8	1	0 → 4	4	1.00	Defines the severity (action taken) when the Temperature Drift Meter # alarm is raised. Valid values are:
									0 = Off
									1 = Display
									2 = Display & stop batch
									3 = Display, stop batch, & close contact
									4 = Display, stop batch, close contact, & lock unit

225	Maximum permissible temperature drift	R/W	User	Float	4	0.0 → 9.999	0.38	1.00	Sets the maximum permissible deviation (in percentage) between readings from two different temperature probes (75,0,31 and 75,0,32) above which the system raises the Temperature Drift Meter # alarm.
226	Temperature drift alarm bitmap	R/O	System	UINT16	2	0 → 15	0	1.00	Shows alarm status for Temperature drift alarm. One bit is used for each meter. When raised/cleared, the respective bit is set to 1 or 0.
227	Internal temperature failure alarm action	R/W	User	UINT8	1	0 → 4	4	1.00	Defines the severity (action taken) when the Internal Temperature Fail alarm is raised. Valid values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, close contact 4 = Display, stop batch, close contact, & lock unit

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
228	No of info prompts [Trans end]	R/W	User	UINT8	1	0 → 5	0	1.00	Sets the number of info messages/prompts (Trans End Prompt Message 1, 63,0,235 or Trans End Prompt Message, 63,0,239) the DL8000 displays at the end of transaction in **manual operating** mode.
229	Maximum allowable device temperature	R/W	User	Float	4	0.0 → 300.0	130	1.00	Defines the maximum allowable device temperature. If the current device temperature exceeds this limit then the system raises the Internal Temp Fail alarm if the Internal Temperature Failure Alarm action (63,0,227) is **not** set to **0** (Off).
230	Transaction Start datetime	R/O	System	TIME	4	Any valid time	01/01/1970 00:00:00	1.00	Shows the transaction's starting date and time, expressed as the number of seconds elapsed since 12 A.M. Jan 1 1970. It shows the value for the **current** transaction (if a transaction is in progress) or for the **previous** transaction (if a transaction is not in progress). The system uses this information for archiving.
231	Transaction End datetime	R/O	System	TIME	4	Any valid time	01/01/1970 00:00:00	1.00	Shows the ending date and time for the previous transaction, expressed as the number of seconds elapsed since 12 A.M. Jan 1 1970. The system uses this information for archiving.
232	Batch Start datetime	R/O	System	TIME	4	Any valid time	01/01/1970 00:00:00	1.00	Shows the batch's starting date and time, expressed as the number of seconds elapsed since 12 A.M. Jan 1 1970. It shows the value for the **current** batch (if a batch is in progress) or for the **previous** batch (if a batch is not in progress). The system uses this information for archiving.

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
233	Batch End datetime	R/O	System	TIME	4	Any valid time	01/01/1970 00:00:00	1.00	Shows the ending date and time for the previous batch, expressed as the number of seconds elapsed since 12 A.M. Jan 1 1970. The system uses this information for archiving.
234	RESERVED								Reserved for future use
235	Trans end prompt message 1	R/W	User	String20	20	Any ASCII string	Trans end prompt #1	1.00	Defines the string for the first info prompt message the DL8000 displays after transaction ends.
236	Trans end prompt message 2	R/W	User	String20	20	Any ASCII string	Trans end prompt #2	1.00	Defines the string for the second info prompt message the DL8000 displays after transaction ends.
237	Trans end prompt message 3	R/W	User	String20	20	Any ASCII string	Trans end prompt #3	1.00	Defines the string for the third info prompt message the DL8000 displays after transaction ends.
238	Trans end prompt message 4	R/W	User	String20	20	Any ASCII string	Trans end prompt #4	1.00	Defines the string for the fourth info prompt message the preset displays after transaction ends.
239	Trans end prompt message 5	R/W	User	String20	20	Any ASCII string	Trans end prompt #5	1.00	Defines the string for fifth info prompt message the DL8000 displays after transaction ends.
240	Digital valve control fail alarm action	R/W	User	UINT8	1	$0 \rightarrow 4$	0	1.00	Defines the severity (action taken) when the Digital Valve Control Fail alarm is raised. Valid values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact. 4 = Display, stop batch, close contact, & lock unit.
241	Digital valve control fail alarm bitmap	R/O	System	UINT16	2	$0 \rightarrow 15$	0	1.00	Shows alarm status for Digital Valve Control Fail alarm for all the meters. One bit will be used for each meter, starting from LSB bit 0 for meter 1. When raised or cleared, respective bit will be set to 1/ 0.
242	RESERVED								Reserved for future use
243	RESERVED								Reserved for future use
244	RESERVED								Reserved for future use

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
245	Driver ID Check	R/W	User	UINT8	1	0 → 1	0	1.00	Enables the driver D check at the start of transaction. Valid values are: 1 = Enabled 0 = Not enabled If the driver ID check is enabled in a **manual operating** mode, then the system validates data item 1 (63,0,188) received in response to data prompt 1 (63,0,187) against the allowed list of 32 driver IDs (61,0,162 to 61,0,192). If the entered data item 1 matches any of these driver IDs, then the system issues the next data prompt or displays the DL8000 entry screen. If data item 1 entered **does not** match any of these driver IDs, the system displays an Invalid Driver message.
246	Rate Reduction	R/W	User	UINT16	2	0 → 9999	100	1.00	Defines the flowrate reduction rate [high (normal) flow rate minus Rate reduction] the system uses if it cannot maintain the high flowrate (that is, used for fallback/recovery in high flow zone). **Note**: Used for inline blend, where this is the reduction flowrate of the entire blend flowrate of high proportion streams.
247	Blend error method	R/W	User	UINT8	1	0	0	1.00	Defines method for computing blend ratio adjustments and sensing blend ratio error conditions. Valid values are: 0 = Percentage Difference
248	RESERVED								Reserved for future use

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
249	Auto Print Enable	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.00	Defines whether auto printing feature of transaction ticket is required. If auto print is enabled then the Batching user program always issues print ticket command to Printer user program at the end of archiving of the transaction. Valid values are: 0 = No 1 = Yes (Automatically print transaction ticket)
249	Auto Print Enable	RW_ CNDL	User	UINT8	1	$0 \rightarrow 1$	0	2.20	Defines whether auto printing feature of transaction ticket is required. If auto print is enabled then the Batching user program always issues print ticket command to Printer user program at the end of archiving of the transaction. Valid values are: 0 = No 1 = Yes (Automatically print transaction ticket)
250	RESERVED								Reserved for future use
251	Low set point	R/W	User	UINT8	1	$0 \rightarrow 100$	20	1.00	Defines the percentage of a stream's maximum flowrate (75,0,3), above which the system uses the high flow percentage error. Otherwise, the system uses low flow percentage error for defining the tolerance band for target flowrate. **Note**: Used only for inline blend.
252	Block Valve Time(s)	R/W	User	UINT8	1	$0 \rightarrow 99$	10	1.00	Defines, in seconds, the maximum duration a block valve should be closed (status read by respective block valve feedback input (69,0,68 to 69,0,71), if not set to undefined) after the system issues a Close command to the block valve. If block valve does not close in this duration, then the system issues a Block Valve Fail Comp # alarm.

Point Type 63: General Preset Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
253	Disp Msg Input control	R/W	TAS	UINT8	1	$0 \rightarrow 1$	0	1.00	Defines whether the numeric keys pressed on keypad display as actual values or as asterisks (*).The TAS writes this parameter (used for the Display Message command), which prompts the operator through a display screen to enter some value in response. Valid values are: 0 = Display numeric keys on display 1 = Display an asterisk (*) for each numeric key pressed
254	Pulse security alarm bitmap	R/O	TAS/ System	UINT16	2	$0 \rightarrow 15$	0	1.00	Indicates alarm status for Pulse Security Meter # alarm for all the meters. **Note**: One bit will be used for each meter, starting from LSB bit 0 for meter 1. When raised/cleared respective bit will be set to 1/ 0.

3.4.5 Point Type 64: General Preset Parameters #2

Description: Point type 64 provides additional general preset parameter.

Number of Logical Points: 1 logical point for each parameter.

Storage Location: Point type 64 is saved to internal configuration memory.

Table 3-6: Point Type 64, General Preset Parameters #2

Point Type 64: General Preset Parameters #2

Param#	Name	Access	Program or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Storage Mem Alarm Percent	R/W	User	UINT8	1	0 → 100	80	2.00	Sets a percentage of total allocated archive storage memory. Once the used archive storage memory reaches this value, an alarm triggers. **Note**: Set this parameter to **0** to disable this alarm.
1	Additive K Factor Unit	RW_ CNDL	User	UINT8	1	0 → 6	0	2.00	Sets the engineering units for the additive K factor (67,x,2). Valid values are: 0 = CC (cubic centimeter) 1 = INCH3 (cubic inches) 2 = Gallons (US) 3 = Liters 4 = Barrels 5 = FT3 (cubic feet) 6 = M3 (cubic meter)
2	Composite Gross Del Qty (Batch)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	2.00	Indicates the composite gross volume delivered in **either** the current batch (when batch is in progress) **or** the previous batch (when a batch is not in progress). **Note**: This total includes main components and additives delivered in the batch. It is the sum of Gross Del Qty (Batch) (63,0,135) and Additive Batch Volume (67,x,36).

Point Type 64: General Preset Parameters #2

Param#	Name	Access	Program or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
3	Composite Gross Del Qty (Transaction)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	2.00	Indicates the gross volume delivered in **either** the current transaction (when the transaction is in progress) **or** the previous transaction (when the transaction is not in progress). **Note**: This total includes main components and additives delivered in the transaction. It is the sum of Gross Del Qty (Trans) (63,0,140) and Additive Batch Volume (67,x,37).
4	RESERVED								Reserved for future use
5	Auto-select Recipe No	R/W	User	UINT8	1	$0 \rightarrow N$	0	2.00	Sets the recipe number which the system automatically selects for transaction authorization. If recipe verification fails, then the invalid recipe screen displays and you can select another recipe. Select **0** to disable automatic recipe selection. This parameter is used **only** in manual operating mode. You can also change the parameter value **after** the transaction authorizes but **before** the first batch in the transaction starts (to select a different recipe or un-authorize the transaction). **Note**: **N** is the number of configured recipes (65,0,26).
6	RESERVED								Reserved for future use

Point Type 64: General Preset Parameters #2

Param#	Name	Access	Program or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
7	Side Detect Method	R/W	User	UINT8	1	$0 \rightarrow 5$	0	2.00	Selects a method for detecting one of three possible positions of the product loading swing arm, based on inputs from one or two swing arm position switches (swing 1 input [64,0,8] and swing 2 input [64,0,9]). The following methods are allowed - 0 = Sgl w/o sw Single side without swing arm switch; side 1 forced active at all times. 1 = Sgl 1 sw (SW2) Single side with one swing arm switch, where SW2 CLOSED = side 1 and SW2 OPEN = parked 2 = Sgl 1 sw (SW1) Single side with one swing arm switch, where SW1 CLOSED = side 1 and SW1 OPEN = parked 3 = Dbl 1 sw (SW2) Double side with one swing arm switch, where SW2 CLOSED = side 1 and SW2 OPEN = side 2 **Note**: SW1 must be OPEN. 4 = Dbl 1 sw (SW1) Double side with one swing arm switch, where SW1 CLOSED = side 1 and SW1 OPEN = side 2 **Note**: SW2 must be OPEN. 5 = Dbl 2 sw Double side with two swing arm switches, where SW2 CLOSED and SW1 OPEN = side 1; SW2 OPEN and SW1 CLOSED = side 2; and SW2 OPEN and SW1 OPEN = parked.

Point Type 64: General Preset Parameters #2

Param#	Name	Access	Program or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
8	Swing Arm 1 Input	R/W	User	TLP	3	Any TLP in ROC	0,0,0	2.00	Sets the digital input for input switch 1. The system uses this value to determine the current side (63,0,145) based on Side Detect Method (64,0,7). **Note**: It should point to status parameter indicating On/Off in ACIO or DI point type with data type as UINT8. If input is not configured then switch status is considered as OPEN or 0.
9	Swing Arm 2 Input	R/W	User	TLP	3	Any TLP in ROC	0,0,0	2.00	Sets the digital input for input switch 2. The system uses this value to determine the current side [63,0,145] based on side detect method [64,0,7]. **Note**: It should point to status parameter indicating On/Off in ACIO or DI point type with data type as UINT8. If input is not configured then switch status is considered as OPEN or 0.
10	Circuit 1 Type	R/W	User	UINT8	1	0 → 2	0	2.00	Sets the side assignment for safety circuit number 1. Side is determined by the swing arm position inputs. The default value is 0 (check safety circuit independent of side). Valid values are: 0 = Side independent 1 = Enabled only if loading at side 1 2 = Enabled only if loading at side 2
11	Circuit 2 Type	R/W	User	UINT8	1	0 → 2	0	2.00	Sets the side assignment for safety circuit number 2. Side is determined by the swing arm position inputs. The default value is 0 (check safety circuit independent of side). Valid values are: 0 = Side independent 1 = Enabled only if loading at side 1 2 = Enabled only if loading at side 2

Point Type 64: General Preset Parameters #2

Param#	Name	Access	Program or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	Circuit 3 Type	R/W	User	UINT8	1	0 → 2	0	2.00	Sets the side assignment for safety circuit number 3. Side is determined by the swing arm position inputs. The default value is 0 (check safety circuit independent of side). Valid values are: 0 = Side independent 1 = Enabled only if loading at side 1 2 = Enabled only if loading at side 2
13	Circuit 4 Type	R/W	User	UINT8	1	0 → 2	0	2.00	Sets the side assignment for safety circuit number 4. Side is determined by the swing arm position inputs. The default value is 0 (check safety circuit independent of side). Valid values are: 0 = Side independent 1 = Enabled only if loading at side haah1 2 = Enabled only if loading at side 2
14	Injections for Additive Calibration	R/W	User/KD	UINT16	2	Any non-zero value	10	2.00	Sets the number of additive injections for the additive meter calibration process. The Additive module performs this number of injections after you press the Start key.
15	RESERVED							1.00	Reserved for future use
16	Additive Delivery Mode	R/W	User/KD	UINT8	1	0 → 1	0	2.00	Sets the additive delivery mode. Valid values are: 0 = Normal Mode 1 = Calibration Mode - Used only during additive meter calibration process.
17	RESERVED							1.00	Reserved for future use
18	Calibration Delay(s)	R/W	User/KD	UINT16	2	Any valid value	5	2.00	Sets a delay (in seconds) that allows the operator to move from preset to the additive injector (if any) when beginning injection during additive calibration process.

Point Type 64: General Preset Parameters #2

Param#	Name	Access	Program or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
19	New Additive to be Calibrated	R/W	User	UINT8	1	0 → 6	0	2.00	Sets the additive number for the meter is to be calibrated. This additive number is stored in Additive to be Calibrated (64,0,22). After storing the value, the system resets the number to the default.
20	Additive Calibration Qty. per Injection	R/W	User	Double	8	Any positive valid IEEE 754 Double	1.00	2.00	Sets the quantity to be injected in one injection cycle during additive calibration process. **Note**: Used only for Control type of Additive Injection.
21	Additive Error Code	R/O	System	UINT8	1	0 → 7	0	2.00	Indicates error code during additive calibration process. Valid values are: 0 = No Error 1 = Invalid Additive Due To Injection Method. Selected additive is not configured for meter or control injection methods. 2 = Invalid Additive Due To Number of Additives Available. Selected additive is more than configured additive in the system. 3 = Additive User Program Not Available or Running. 4 = Additive Calibration Qty Per Injection not configured for Selected additive when injection method is Control. 5 = Injections For Additive Calibration is zero. 6 = K factor not configured. 7 = Meter factor not configured. **Note**: Some error codes are not supported.
22	Additive to be Calibrated	R/O	System	UINT8	1	0 → 6	0	2.00	Shows the additive whose meter is to be calibrated. Set this parameter to **0** to indicate that no additive is selected.

Point Type 64: General Preset Parameters #2

Param#	Name	Access	Program or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
23	Net Forward Gross Batch Total	R/O	System	Double	8	Any valid IEEE double precision float	0	2.00	Shows Net Gross Batch total (calculated as Total forward flow - Reverse flow). Value resets when batch is authorized. **Note**: This total updates only if at least one meter is configured for reverse flow.
24	Net Forward Net Std Batch Total	R/O	System	Double	8	Any valid IEEE double precision float	0	2.00	Shows net standard batch total (calculated as Total forward flow - Reverse flow). Value resets when batch is authorized. **Note**: This total updates only if at least one meter is configured for reverse flow.
25	Net Forward Mass Batch Total	R/O	System	Double	8	Any valid IEEE double precision float	0	2.00	Shows Net Mass Batch total (calculated as Total forward flow - Reverse flow). Value resets when batch is authorized. **Note**: This total updates only if at least one meter is configured for reverse flow.
26	Preset Additive Option	R/W	User	UINT8	1	$0 \rightarrow 1$	0	2.00	Indicates whether batch preset quantity entered (63,0,39) excludes or includes the additive batch quantity. Valid values are: 0 = Exclusive (Preset Qty excludes Additive Qty) 1 = Inclusive (that is Preset Qty includes Additive Qty. **Note**: If you set this parameter as **Inclusive** then additive user program should be running, preset delivery type (63,0,29) should be Gross Volume, and all additive types (67,x, 8) should be configured as Downstream [1]. .

Point Type 64: General Preset Parameters #2

Param#	Name	Access	Program or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
27	Transaction Swing Arm Side	R/W	User/TAS	UINT8	1	0 → 2	1	2.00	Sets the side on which transaction is authorized. In **auto operating** mode, this parameter locks after the transaction is authorized. In **manual operating** mode, it is selected by device. Valid values are: 0 = Invalid side 1 = Loading allowed on side 1 2 = Loading allowed on side 2 **Note**: In auto operating mode, the TAS writes this parameter and specifies the side requested by TAS prior to authorizing a new transaction. Side is determined by the swing arm position inputs.
28	TA End Trans Side	R/W	User/TAS	UINT8	1	0 → 2	1	2.00	Sets, in auto operating mode, the swing arm side for which ending of transaction is requested by the Issuing End transaction [0x07] TAS command. The side should be the same for which transaction is authorized (64,0,27).
29	Block Value Fail Alarm Bitmap	R/O	System	UINT16	2	0 → 15	0	1.22	Shows the alarm status for the Block Valve Fail Comp # alarm for all meters. **Note**: One bit is used for each component, starting from LSB bit 0 for component 1. When raised or cleared, respective bit is set to 1 or 0.
30	RESERVED								Reserved for future use
31	RESERVED								Reserved for future use
32	RESERVED								Reserved for future use
33	RESERVED								Reserved for future use
34	RESERVED								Reserved for future use
35	RESERVED								Reserved for future use
36	RESERVED								Reserved for future use

Point Type 64: General Preset Parameters #2

Param#	Name	Access	Program or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
37	Maximum Bad Pulses Allowed	R/W_ CNDL	User	UINT16	2	0 → 65535	10	2.34	Sets the maximum number of bad pulses, after which the pulse security alarm occurs. (Parameter attribute changed to R/W_CNDL as per Industry Canada requirements.)
38	Bad Pulse Count Reset Option	R/W_ CNDL	User	UINT8	1	0 → 1	1	2.34	Sets the option for resetting the bad pulse counter. Bad pulses are used to raise pulse security alarm. Valid values are: 0 = Accumulate until alarm is raised 1 = Reset on every batch authorization (Parameter attribute changed to R/W_CNDL as per Industry Canada requirements.)
39	Legal Record	RW_ CNDL	User	UINT8	1	0 → 2	0	2.20	Indicates whether history or printouts are legal records or if legal records are not required. Valid values are: 0 = No Legal Record 1 = Printout 2 = History
40	Data Error	R/W	System	UINT16	2	0 → 65535	0	2.4	Kepps status of Error (NaN or Divide by zero) for each program. If this sets that NaN of Infinity alarm will raise. It will reset when new transaction authorized. (TLP made unreserved in version 2.34B for user information. This TLP status bitwise is provided in ROCLINK display file Preset Display #11.)
40.0	Additive NaN Found								Error found in respective program
40.1	Batching NaN Found								Error found in respective program
40.2	Printing NaN Found								Error found in respective program
40.3	History NaN Found								Error found in respective program
40.4	KD NaN Found								Error found in respective program
40.5	Liquid NaN Found								Error found in respective program
40.6	RESERVED								Reserved for future use
40.7	RESERVED								Reserved for future use
40.8	Additive Infinity Found								Error found in respective program

Point Type 64: General Preset Parameters #2

Param#	Name	Access	Program or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
40.9	Batching Infinity Found								Error found in respective program
40.10	Printing Infinity Found								Error found in respective program
40.11	History Infinity Found								Error found in respective program
40.12	Additive Infinity Found								Error found in respective program
40.13	Liquid Cal Infinity Found								Error found in respective program
40.14	RESERVED								Reserved for future use
40.15	RESERVED								Reserved for future use
41	RESERVED								Reserved for internal use
41.0	RESERVED								Reserved for internal use
41.1	RESERVED								Reserved for internal use
41.2	RESERVED								Reserved for internal use
41.3	RESERVED								Reserved for future use
41.4	RESERVED								Reserved for future use
41.5	RESERVED								Reserved for future use
41.6	RESERVED								Reserved for future use
41.7	RESERVED								Reserved for future use
41.8	RESERVED								Reserved for future use
41.9	RESERVED								Reserved for future use
41.10	RESERVED								Reserved for future use
41.11	RESERVED								Reserved for future use
41.12	RESERVED								Reserved for future use
41.13	RESERVED								Reserved for future use
41.14	RESERVED								Reserved for future use
41.15	RESERVED								Reserved for future use
42	Keypad Display Comm Fail Alarm	RW_ CNDL	User	UINT8	1	0 → 4	0	2.20	Sets alarm severity for keypad display communication fail condition. Valid values are: 0 = Off 1 = Display 2 = Display & stop batch 3 = Display, stop batch, & close contact 4 = Display, stop batch, close contact, & lock unit

Point Type 64: General Preset Parameters #2

Param#	Name	Access	Program or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
43	History Data Retention Days	RW_ CNDL	User	UINT8	1	0 → 100	100	2.20	Indicates the number of days (**1-100**) the system retains transaction data in history. Requests for transaction deletion are processed only if the oldest transaction is older than the indicated value. **Note**: Set this field to **0** to indicate that history retention is not needed.
44	RESERVED								Reserved for internal use.
45	RESERVED								Reserved for internal use.
46	RESERVED								Reserved for internal use.
47	RESERVED								Reserved for internal use.
48	RESERVED								Reserved for internal use.
49	RESERVED								Reserved for internal use.
50	RESERVED								Reserved for internal use.
51	RESERVED								Reserved for internal use.
52	RESERVED								Reserved for internal use.
53	RESERVED								Reserved for internal use.
54	Stored Product Volume Unit	R/O	User	UINT8	1	0 → 1	1	2.22	Indicates whether the user history program stores the product volume unit at the end of the transaction. Valid values are: 0 = Idle state; do not store 1 = Store at end of transaction
55	Stored Product Mass Unit	R/O	User	UINT8	1	0 → 1	1	2.22	Indicates whether the user history program stores the product mass unit at the end of the transaction. Valid values are: 0 = Idle state; do not store 1 = Store at end of transaction
56	Strore Additive Volume Unit	R/O	User	UINT8	1	0 → 1	1	2.22	Indicates whether the user history program stores the additive volume unit at the end of the transaction. Valid values are: 0 = Idle state; do not store 1 = Store at end of transaction

Point Type 64: General Preset Parameters #2

Param#	Name	Access	Program or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
57	TD Product Volume Unit	R/W	System	UINT8	1	0 → 6	0	2.22	Indicates whether the history user program stores the product volume unit data. **Note**: System populates this field **only** if parameter 54 is **1**.
58	TD Product Mass Unit	R/W	System	UINT8	1	0 → 3	0	2.22	Indicates whether the history user program stores the product mass unit data. **Note**: System populates this field **only** if parameter 55 is **1**.
59	TD Additive Volume Unit	R/W	System	UINT8	1	0 → 6	0	2.22	Indicates whether the history user program stores the additive volume unit data. **Note**: System populates this field **only** if parameter 56 is **1**.
60	Additive Alarm Bitmap	R/W	System	UINT16	2	0 → 1023	0	2.23	Indicates the alarm status of each additive for the Additive Fail # alarm. LSB bit 0 indicates the status of additive #1, and bit 9 indicates the status of additive #10. Valid values are **1** (Alarm Active) and **0** (Alarm Inactive).
61	Rev Valve Config Option	R/W	User	UINT8	1	0 → 1	0	2.30	Selects the type of reverse meter valve. Valid values are **0** (Single Acting Valve) and **1** (Double Acting Valve).
62	Low Flow Cutoff	R/W	User	Float	4	0.0 → 999999.0	0	2.30	Sets the low flow cutoff limit to close the block valve in low flow stop zone (in case of fake pulses). For any non-zero value, if the blend flow rate (set in parameter 59 of point type 63) falls below the low flow cutoff limit and the component is entered in the final stop zone, the respective block valve closes. **Note**: Enter **0** to **disable** this feature.

Point Type 64: General Preset Parameters #2

Param#	Name	Access	Program or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
63	InputsOutOfBound Alarm Action	R/W_ CNDL	User	UINT8	1	$0 \rightarrow 4$	1	2.34	Alarm occurs when the Liquid Calc program sets bit 1 of Calculation Alarm Status parameter (70,0,24) to **1**. (Parameter attribute changed to R/W_CNDL as per Industry Canada requirements.)

3.4.6 Point Type 65: Transaction History Parameters (#2)

Description: Point type 65 provides additional transaction history parameters.

Number of Logical Points: 1 logical point for each parameter

Storage Location: Point type 65 is saved to internal configuration memory.

Table 3-7: Point Type 65, Transaction History Parameters #2

Point Type 65: Transaction History Parameters #2

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Add 7 Gross Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.23	Defines the gross quanity for additive 7, as provided by the history user program. **Note**: The system adds this information to the batch **only** if you set parameter 19 for point type 61(Store Additive Gross Quantity) to **1**.
1	Add 8 Gross Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.23	Defines the gross quanity for additive 8, as provided by the history user program. **Note**: The system adds this information to the batch **only** if you set parameter 19 for point type 61(Store Additive Gross Quantity) to **1**.
2	Add 9 Gross Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.23	Defines the gross quanity for additive 9, as provided by the history user program. **Note**: The system adds this information to the batch **only** if you set parameter 19 for point type 61(Store Additive Gross Quantity) to **1**.
3	Add 10 Gross Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.23	Defines the gross quanity for additive 10, as provided by the history user program. **Note**: The system adds this information to the batch **only** if you set parameter 19 for point type 61(Store Additive Gross Quantity) to **1**.
4	RESERVED								Reserved for future use
5	RESERVED								Reserved for future use
6	Trans Add 7 Gross	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.23	Defines the transaction gross quantity for additive 7, as provided by the history user program.
7	Trans Add 8 Gross	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.23	Defines the transaction gross quantity for additive 8, as provided by the history user program.
8	Trans Add 9 Gross	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.23	Defines the transaction gross quantity for additive 9, as provided by the history user program.

Point Type 65: Transaction History Parameters #2

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
9	Trans Add 10 Gross	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.23	Defines the transaction gross quantity for additive 10, as provided by the history user program.
10	RESERVED								Reserved for future use
11	RESERVED								Reserved for future use
12	Store Net Forward Total Mass Batch	R/W	User	UINT8	1	0 → 255	0	2.30	Defines whether the system archives net forward mass batch values (as totaled by the history user program) when the Store Batch command is received and the batch ends. Valid values are **0** (idle state; do not store) and **1** (store at end of batch).
13	Net Forward Total Mass Batch	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.30	Defines the net forward total mass batch quantity as provided by the history user program. **Note**: The system adds this information to the batch **only** if you set parameter 12 for point type 65 (Store Net Forward Total Mass Batch) to **1**.
14	Store Reverse Meter Mass Total Batch	R/W	User	UINT8	1	0 → 255	0	2.30	Defines whether the system archives reverse meter mass totals (defined by parameter 56 in point type 57) when the Store Batch command is received and the batch ends. Valid values are **0** (idle state; do not store) and **1** (store at end of batch).
15	Reverse Meter1 Mass Total Batch	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.30	Defines the reverse mass total mass batch quantity for meter 1, as provided by the history user program. **Note**: The system adds this information to the batch **only** if you set parameter 14 for point type 65 (Store Reverse Meter Mass Total Batch) to **1**.
16	Reverse Meter2 Mass Total Batch	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.30	Defines the reverse mass total mass batch quantity for meter 2, as provided by the history user program. **Note**: The system adds this information to the batch **only** if you set parameter 14 for point type 65 (Store Reverse Meter Mass Total Batch) to **1**.
17	Reverse Meter3 Mass Total Batch	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.30	Defines the reverse mass total mass batch quantity for meter 3, as provided by the history user program. **Note**: The system adds this information to the batch **only** if you set parameter 14 for point type 65 (Store Reverse Meter Mass Total Batch) to **1**.

Point Type 65: Transaction History Parameters #2

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
18	Reverse Meter4 Mass Total Batch	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.30	Defines the reverse mass total mass batch quantity for meter 4, as provided by the history user program. **Note**: The system adds this information to the batch **only** if you set parameter 14 for point type 65 (Store Reverse Meter Mass Total Batch) to **1**.
19	Store Meter Mass Total Batch	R/W	User	UINT8	1	0 → 255	0	2.30	Defines whether the system archives mass meter batch totals (defined by parameter 13 in point type 75) when the Store Batch command is received and the batch ends. Valid values are **0** (idle state; do not store) and **1** (store at end of batch).
20	Meter1 Mass Total Batch	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.30	Defines the reverse mass total batch quantity for meter 1, as provided by the history user program. **Note**: The system adds this information to the batch **only** if you set parameter 19 for point type 65 (Store Meter Mass Total Batch) to **1**.
21	Meter2 Mass Total Batch	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.30	Defines the reverse mass total batch quantity for meter 2, as provided by the history user program. **Note**: The system adds this information to the batch **only** if you set parameter 19 for point type 65 (Store Meter Mass Total Batch) to **1**.
22	Meter3 Mass Total Batch	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.30	Defines the reverse mass total batch quantity for meter 3, as provided by the history user program. **Note**: The system adds this information to the batch **only** if you set parameter 19 for point type 65 (Store Meter Mass Total Batch) to **1**.
23	Meter4 Mass Total Batch	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0.0	2.30	Defines the reverse mass total batch quantity for meter 4, as provided by the history user program. **Note**: The system adds this information to the batch **only** if you set parameter 19 for point type 65 (Store Meter Mass Total Batch) to **1**.
24	Target Stored Transaction	R/O	System	UINT16	2		0	2.33	Indicates remaining stored transaction in history after successful deletion
25	Target Stored Batch	R/O	System	UINT16	2		0	2.33	Indicates remaining stored batch in history after successful deletion
26	Target Oldest Transaction Index	R/O	System	UINT16	2		0	2.33	Indicates oldest transaction's index if deletion is successful
27	Target Oldest Batch Index	R/O	System	UINT16	2		0	2.33	Indicates Oldest batch's index if deletion is successful

Point Type 65: Transaction History Parameters #2

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
28	Recently Archived Transaction	R/O	System	UINT16	2	0 -> 9999	9999	2.33	Store most recently archive transaction. If batching program cleared and downloaded again then it will read history and update this tlp on booting. If values of this parameter do not match with current transaction on booting then new archiving request will be sent.
29	Recently Archived Batch	R/O	System	UINT16	2	0 -> 9999	9999	2.33	Store most recently archive batch. If batching program cleared and downloaded again then it will read history and update this tlp on booting. If values of this parameter do not match with current batch number on booting then new archive request will be sent.
30	Batches in Curr. Transaction	R/O	System	UINT16	2	0 -> 10000	0	2.33	Indicates successful batches archived in current transaction
31	First Batch in Curr. Transaction	R/O	System	UINT16	2	0 -> 9999	10000	2.33	Indicates stored transaction in history if current archving is successful
32	New Transaction Stored	R/O	System	UINT16	2			2.33	Indicates stored transaction in history if current archving is successful
33	New Batch Stored	R/O	System	UINT16	2			2.33	Indicates stored batch in history if current archiving is successful

3.4.7 Point Type 67: Additives

Description: Point type 67 provides parameters for additives.

Number of Logical Points: 1 logical point for each active additive.

Storage Location: Point type 67 is saved to internal configuration memory.

Table 3-8: Point Type 67, Additives

Point Type 67: Additives

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	RESERVED								Reserved for future use
0	RESERVED							2.00	Reserved for future use
1	Injection method	R/W	User	UINT8	1	$0 \rightarrow 3$	0	2.00	Sets the injection method for the additive. The following options are possible - 0=Mechanical 1=Handshake 2=Meter 3=Control Since the injection method is configured per additive, one additive can be injected via a simple mechanical injector ("Mech") while another can be injected and measured via an additive panel ("Control"). **Note**: Release 1.0 supports Mechanical and Handshake injection methods.

Point Type 67: Additives

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
2	Volume per pulse/K-factor	RW_ CNDL	User	Float	4	0 → 9999.99	0.00	1.00	Totalizes additive flows for both authorized and unauthorized flows. This parameter acts as volume per pulse in case of Mechanical and Handshake type of additive injections. If feedback is configured then add this much qty to totalizers when a pulse is received on feedback channel. If feedback is not configured then add this much qty to totals when ratio output is energized. This parameter acts as K factor of additive meter in case of Meter and Control type of additive injection.
3	RESERVED							1.00	Reserved for future use
3	RESERVED							2.00	Reserved for future use
4	Additive feedback count	R/W	User	UINT16	2	0 → 9999	0	1.00	Sets (for the mechanical injection method) the number of pulses per additive ratio cycle. Indicates value in seconds. If ratio output is energized and feedback pulse is not received within configurable second then raise Additive fail alarm ("T" alarm). **Note**: Set this value to 0 (zero) to disable this alarm
5	RESERVED								Reserved for future use
6	Ratio Value output	R/W	User	TLP	3	DO/AC IO TLP	0,0,0	1.00	Sets the “Status” parameter of output channel for DO and “Auto Output” parameter of output channel for ACIO. The system cycles this output according to ratio cycle injection percentage and internal additive ratio quantity.
7	Feedback input	R/W	User	TLP	3	DI/PI/APM TLP	0,0,0	1.00	Sets the TLP stores the value at which the system receives feedback pulses from injector. Select “Accumulated Pulses” for DI, PI, and APM. Parameter should be :Raw Pulse Count PI 1/2/3/4.
8	RESERVED							1.00	Reserved for future use

Point Type 67: Additives

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
8	Additive Type	R/W	User	UINT8	1	0 → 1	1	2.00	Indicates if additive is injected before or after main product meter. Values are: 0 = Upstream (additive injected before main product meter and is included in component totals) 1= Downstream (additive injected after main product meter and is not included in component totals). **Notes**: 1. If you configure additive injection as **Downstream**, then the system adds this additive delivered quantity to calculate Composite Gross Batch Totals (64,0,2) and Composite Gross Transaction Totals (64,0,3). 2. If you configure Additive Preset Option (64,0,26) is **inclusive**, then you must configure all additives as **Downstream**. 3. Configure **all** additives as either **Upstream** or **Downstream**.
9	Additive pump output	R/W	User	TLP	3	DO/AC IO TLP	0,0,0	1.00	Controls additive pump. If configured then output is energized for respective additive at the start of the batch & de-energized after a configurable time after end of batch. For output channel, select “Status” parameter for DO and “Auto Output” for ACIO.
10	RESERVED								Reserved for future use
11	Additive block valve output	R/W	User	TLP	3	DO/AC IO TLP	0,0,0	1.00	Controls the additive block valve. If configured then output will be used to block the additive flow towards the injector when the additive pump is made ON. Status parameter of output channel should be selected.
12	Running Totalizer	R/O	System	Float	4	Any valid IEEE 754 float within rollover limit	0	1.00	Stores additive authorized total since DL8000 was initialized.
12	RESERVED							2.00	Reserved for future use

Point Type 67: Additives

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
13	Additive Batch Totalizer	R/O	System	Float	4	Any valid IEEE 754 float within rollover limit	0	1.00	Stores additive value totalized for the current batch.
13	RESERVED							2.00	Reserved for future use
14	Additive Transaction Totalizer	R/O	System	Float	4	Any valid IEEE 754 float within rollover limit	0	1.00	Stores additive value totalized for the current transaction.
14	RESERVED							2.00	Reserved for future use
15	Additive Unauthorized Totalizer	R/O	System	Float	4	Any valid IEEE 754 float within rollover limit	0	1.00	Stores unauthorized additive value since preset was initialized.
15	RESERVED							2.00	Reserved for future use
16	Control Meters	R/W	User	String10	10	Any valid string	GGGG	1.00	Indicates how the system considers flow for each meter for additive injection. Each alphabetic represents one meter. Valid values are: G = Use Gross qty S = Use net std. qty M = Use Mass qty X = Do not consider this meter
16	RESERVED							2.00	Reserved for future use
17	Ratio cycle Inject percentage	R/W	User	UINT8	1	0 → 100	50	1.00	Sets the percentage value of internal ratio cycle when injection begins in each injection cycle.
18	RESERVED							1.00	Reserved for future use
18	RESERVED							2.00	Reserved for future use
19	Roll Over Limit	R/O	System	Float	4	0 → 214748	214748	1.02	Sets the roll over limit. If non-resettable totalizer crosses this limit then it resets to zero.
20	RESERVED							1.00	Reserved for future use
20	Product/Additive Low Limit	R/W	User	UINT8	1	0 → 99	0	2.00	Sets the configured ratio of product delivered to additive in a batch. If additive injected falls below this value during the batch the Batch Additive Fail alarm raises.
21	RESERVED							1.00	Reserved for future use

Point Type 67: Additives

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
21	Product/Additive High Limit	R/W	User	UINT8	1	0 → 99	0	2.00	Sets configured ratio of product delivered to additive in a batch. If additive injected rises above this value during the batch the Batch Additive Fail alarm raises.
22	RESERVED								Reserved for future use
23	RESERVED								Reserved for future use
24	RESERVED								Reserved for future use
25	RESERVED								Reserved for future use
26	Discrete input selection	R/W	User	TLP	3	DI/AC IO TLP	0,0,0	1.00	Sets discrete input method selection input. Parameter should be status of input channel.
27	Ratio quantity	R/W	User	UINT16	2	0 → 9999	40	1.00	Sets quantity in product units which controls one additive injection cycle for given additive.
28	Additive Meter Factor	RW_ CNDL	User	Float	4	Any positive non-zero	1	2.00	Sets the meter factor for the additive meter.
29	Unauthorized Additive Pulses	R/W	User	UINT16	2	Any valid value	200	2.00	Sets the maximum number of unauthorized additive pulses allowed within configured time (67,x,44). If the DL8000 receives more than the designated number of pulses it raises the Additive fail Unauthorized alarm. **Note**: Set **0** for this parameter to disable the alarm.
30	Additive Calibration Total	R/O	System	Double	8	Any valid value	0	2.00	Stores the additive totalized value during the additive meter calibration process.
31	Prover Volume	R/W	User	Double	8	Any valid value	0	2.00	Sets the volume of additive measured in beaker during the calibration process.
32	New Meter Factor	R/O	System	Double	8	Any valid value	0	2.00	Shows the meter factor value calculated after calibration process.
33	Actual Injections During Additive Calibration	R/O	System	UINT32	4	Any valid value	0	2.00	Shows the actual number of additive injections occurring during the additive meter calibration process.
34	Meter Pulses During Additive Calibration	R/O	System	UINT32	4	Any value value	0	2.00	Shows continuously the number of meter pulses received during a meter calibration process.

Point Type 67: Additives

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
35	Additive Running Totalizer	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	2.00	Stores additive authorized total since the DL8000 was initialized.
36	Additive Batch Totalizer	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	2.00	Stores additive totalized for the current batch.
37	Additive Transaction Totalizer	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	2.00	Stores additive totalized for the current transaction.
38	Additive Unauthorized Totalizer	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	2.00	Stores the unauthorized additive total ever since the DL8000- was initialized.
39	RESERVED								Reserved for future use.
40	RESERVED								Reserved for future use.
41	RESERVED								Reserved for future use.
42	RESERVED								Reserved for future use.
43	RESERVED								Reserved for future use.
44	Additive Unauth Pulses Reset Time	R/W	User	UINT16	2	$0 \rightarrow 2$	60	2.01	Checks the additive for unauthorized flow. If within the configured time the DL8000 receives more than the configured number of unauthorized pulses (67,x,29) the system raises the Additive Fail Unauthorized alarm. **Note**: This parameter is applicable only for Meter and Control injection method (67,x,1).
45	RESERVED								Reserved for future use
46									
47									
48									

3.4.8 Point Type 68: Recipes

Description: Point type 68 provides parameters for recipies.

Number of Logical Points: 1 logical point for each active recipe.

Storage Location: Point type 68 is saved to internal configuration memory.

Table 3-9: Point Type 68, Recipes

Point Type 68: Recipes

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Name	R/W	User	String20	20	Any ASCII String	Recipe #x	1.00	Name of recipe
1	Percentage of Component 1	R/W	User	Float	4	0 → 100	100	1.00	Sets the percentage of this component used in the delivered blend. **Note**: **0** (zero) means the component is not used.
2	Percentage of Component 2	R/W	User	Float	4	0 → 100	0	1.00	Sets the percentage of this component used in the delivered blend. **Note**: **0** (zero) means the component is not used.
3	Percentage of Component 3	R/W	User	Float	4	0 → 100	0	1.00	Sets the percentage of this component used in the delivered blend. **Note**: **0** (zero) means the component is not used.
4	Percentage of Component 4	R/W	User	Float	4	0 → 100	0	1.00	Set the percentage of this component used in the delivered blend. **Note**: **0** (zero) means the component is not used.
5	Flushing	R/W	User	UINT8	1	0 → 1	0	1.00	Sets whether flushing is done in the recipe. Valid values are: 0 = Disable flush 1 = Enable flush

Point Type 68: Recipes

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6	Recipe Additives	R/W	User	String10	10	0000000000→ 1111111111	0	1.00	Sets the status of one additive, starting from most significant character for additive 1. Valid values are: 1 = Enable additive for recipe 0 = Disable additive for recipe The system uses this parameter when additive selection method is via recipe selection or recipe selection with multi rate.
7	Additive 1 Ratio Quantity	R/W	User	UINT16	2	0 → 9999	40	1.00	Sets quantity of base products which controls one injection cycle for additive 1. **Note**: The system uses this parameter only in case of recipe with multi rate selection method.
8	Additive 2 Ratio Quantity	R/W	User	UINT16	2	0 → 9999	40	1.00	Sets quantity of base products which controls one injection cycle for additive 2. **Note**: The system uses this parameter only in case of recipe with multi rate selection method.
9	Additive 3 Ratio Quantity	R/W	User	UINT16	2	0 → 9999	40	1.00	Sets quantity of base products which controls one injection cycle for additive 3. **Note**: The system uses this parameter only in case of recipe with multi rate selection method.
10	Additive 4 Ratio Quantity	R/W	User	UINT16	2	0 → 9999	40	1.00	Sets quantity of base products which controls one injection cycle for additive 4. **Note**: The system uses this parameter only in case of recipe with multi rate selection method.
11	Additive 5 Ratio Quantity	R/W	User	UINT16	2	0 → 9999	40	1.00	Sets quantity of base products which controls one injection cycle for additive 5. **Note**: The system uses this parameter only in case of recipe with multi rate selection method.

Point Type 68: Recipes

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	Additive 6 Ratio Quantity	R/W	User	UINT16	2	0 → 9999	40	1.00	Sets quantity of base products which controls one injection cycle for additive 6. **Note**: The system uses this parameter only in case of recipe with multi rate selection method.
13	RESERVED								Reserved for future use
14	RESERVED								Reserved for future use
15	RESERVED								Reserved for future use
16	RESERVED								Reserved for future use
17	Delivery Sequence or Low Proportion	R/W	User	String10	10	ASCII String	1	1.00	Used differently based on the configured Unit Type. **Unit Type is Sequential Blend** This indicates delivery sequence which specifies the sequence in which all components should be delivered. Ex. if **312** is configured then 1st deliver component 3, 2nd deliver component 1 and at last deliver component 2. **Unit Type is Inline Blend** This indicates whether a component is high proportion [0] or low proportion [1]. Inline proportional blending is used for maintaining ratio between all high proportion components.
18	RESERVED								Reserved for future use
19	Recipe Gross Del Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	1.00	Shows the gross quantity delivered for current recipe since DL8000 was initialized. Value rolls over when it crosses roll over limit.
20	RESERVED								Reserved for future use
21	Recipe Net Std Del Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	1.00	Shows the net quantity delivered for current recipe since unit is initialized. It will roll over when it crosses roll over limit.
22	Recipe Mass Del Qty	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	1.00	Shows the mass quantity delivered for current recipe since unit is initialized. It will roll over when it crosses roll over limit.

Point Type 68: Recipes

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
23	Recipe Low Flow Start Rate	R/W	User	Float	4	0 → 99999.9	250	1.00	Sets the low flow start rate setpoint for the batch recipe loading profile. This is used when Unit Type is inline blender. **Note**: This target flowrate is always delivery type (63,0,29) based flowrate.
24	Recipe High flow rate	R/W	User	Float	4	0 → 99999.9	800	1.00	Sets the high flow rate setpoint for the batch recipe loading profile. This is used when Unit Type is inline blender. **Note**: This target flowrate is always delivery type (63,0,29) based flowrate.
25	RESERVED								Reserved for future use
26	RESERVED								Reserved for future use
27	RESERVED							1.00	Reserved for future use
28	RESERVED							1.00	Reserved for future use
29	RESERVED							1.00	Reserved for future use
30	RESERVED							1.00	Reserved for future use
31	Additive 1 Control Component	R/W	User	String10	10	ASCII string	G	2.00	Sets, for additive 1, what flow to consider to control ratio output. Each alphabetic character represents one component. Valid values are: G = Use gross quantity of component S = Use net quantity of component M = Use mass quantity of component X = Don't use quantity of component

Point Type 68: Recipes

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
32	Additive 2 Control Component	R/W	User	String10	10	ASCII string	G	2.00	Sets, for additive 2, what flow to consider to control ratio output. Each alphabetic character represents one component. Valid values are: G = Use gross quantity of component S = Use net quantity of component M = Use mass quantity of component X = Don't use quantity of component
33	Additive 3 Control Component	R/W	User	String10	10	ASCII string	G	2.00	Sets, for additive 3, what flow to consider to control ratio output. Each alphabetic character represents one component. Valid values are: G = Use gross quantity of component S = Use net quantity of component M = Use mass quantity of component X = Don't use quantity of component
34	Additive 4 Control Component	R/W	User	String10	10	ASCII string	G	2.00	Sets, for additive 4, what flow to consider to control ratio output. Each alphabetic character represents one component. Valid values are: G = Use gross quantity of component S = Use net quantity of component M = Use mass quantity of component X = Don't use quantity of component

Point Type 68: Recipes

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
35	Additive5 Control Component	R/W	User	String10	10	ASCII string	G	2.00	Sets, for additive 5, what flow to consider to control ratio output. Each alphabetic character represents one component. Valid values are: G = Use gross quantity of component S = Use net quantity of component M = Use mass quantity of component X = Don't use quantity of component
36	Additive 6 Control Component	R/W	User	String10	10	ASCII string	G	2.00	Sets, for additive 6, what flow to consider to control ratio output. Each alphabetic character represents one component. Valid values are: G = Use gross quantity of component S = Use net quantity of component M = Use mass quantity of component X = Don't use quantity of component

Point Type 68: Recipes

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
37	Additive 1 Qty/Injection	R/W	User	Double	8	0 → 9999999999.9999	0.000	2.00	Sets the required quantity of additive 1 during each injection. The quantity is in configured units (63,0,101). Additive 1 Ratio quantity controls the injections. **Notes**: 1. The system uses this parameter in case of control injection method (67,x,1) configured for this additive to calculate ideal pulses per injection. This quantity should be configured such that ideal pulses per injection should not be less than one) 2. The system uses this parameter in case of metered injection method configured for this additive for scanning of additive high and low alarms. If this quantity is set as 0 then alarm is not raised. 3. The system uses this parameter for control or meter injection method configured for this additive to calculate additive volume in preset qty entered (63,0,39) in case of additive as a part of preset. 4. This parameter, if configured less than 0.0000001, will be considered as zero.
38	Additive 2 Qty/Injection	R/W	User	Double	8	0 → 9999999999.9999	0.000	2.00	For additive 2, as described for Additive 1 Qty/Injection.
39	Additive 3 Qty/Injection	R/W	User	Double	8	0 → 9999999999.9999	0.000	2.00	For additive 3, as described for Additive 1 Qty/Injection.
40	Additive 4 Qty/Injection	R/W	User	Double	8	0 → 9999999999.9999	0.000	2.00	For additive 4, as described for Additive 1 Qty/Injection.
41	Additive 5 Qty/Injection	R/W	User	Double	8	0 → 9999999999.9999	0.000	2.00	For additive 5, as described for Additive 1 Qty/Injection.
42	Additive 6 Qty/Injection	R/W	User	Double	8	0 → 9999999999.9999	0.000	2.00	For additive 6, as described for Additive 1 Qty/Injection.
43	Additive 7 Qty/Injection	R/W	User	Double	8	0 → 9999999999.9999	0.000	2.23	For additive 7, as described for Additive 1 Qty/Injection.
44	Additive 8 Qty/Injection	R/W	User	Double	8	0 → 9999999999.9999	0.000	2.23	For additive 8, as described for Additive 1 Qty/Injection.

Point Type 68: Recipes

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
45	Additive 9 Qty/Injection	R/W	User	Double	8	0 → 9999999999.9999	0.000	2.23	For additive 9, as described for Additive 1 Qty/Injection.
46	Additive 10 Qty/Injection	R/W	User	Double	8	0 → 9999999999.9999	0.000	2.23	For additive 10 as described for Additive 1 Qty/Injection.
47	RESERVED								Reserved for future use
48	RESERVED								Reserved for future use
49	Additive 7 Control Component	R/W	User	String10	10	ASCII string	G	2.23	Specifies the product for additive 7, the flow of which must be considered to control ratio output. Each character represents one component: G = Use gross quantity of component S = Use net quantity of component M = Use mass quantity of component X = Don't use quantity of component
50	Additive 8 Control Component	R/W	User	String10	10	ASCII string	G	2.23	Specifies the product for additive 8, the flow of which must be considered to control ratio output. Each character represents one component: G = Use gross quantity of component S = Use net quantity of component M = Use mass quantity of component X = Don't use quantity of component
51	Additive 9 Control Component	R/W	User	String10	10	ASCII string	G	2.23	Specifies the product for additive 9, the flow of which must be considered to control ratio output. Each character represents one component: G = Use gross quantity of component S = Use net quantity of component M = Use mass quantity of component X = Don't use quantity of component

Point Type 68: Recipes

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
52	Additive 10 Control Component	R/W	User	String10	10	ASCII string	G	2.23	Specifies the product for additive 10, the flow of which must be considered to control ratio output. Each character represents one component: G = Use gross quantity of component S = Use net quantity of component M = Use mass quantity of component X = Don't use quantity of component

3.4.9 Point Type 69: Components

Description: Point type 69 provides parameters for components.

Number of Logical Points: 1 logical point for each active component.

Storage Location: Point type 69 is saved to internal configuration memory.

Table 3-10: Point Type 69, Components

Point Type 69: Components

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Low Flow Start Quantity (Gross)	R/W	User	UINT32	4	0 → 99999	50	1.00	Sets the gross volume to be delivered at low flow start rate. **Note**: Low flow start rate to high flow rate transition is based on gross volume delivered.
1	Low Flow Restart Quantity (Gross)	R/W	User	UINT32	4	0 → 99999	20	1.00	Sets the gross volume to be delivered at low flow start rate when **either**: 1. Suspended batch restarts for which the Low Flow Start Quanity (Gross) has already been delivered **or** 2. Component (other than the first component in a sequential blend) starts. **Note**: Low flow start rate to high flow rate transition is based on gross volume delivered.
2	Low Flow Stop Quantity	R/W	User	UINT32	4	0 → 99999	50	1.00	Sets the quantity (based on configured Delivery Type) to deliver at low flow rate or stop rate before all flow is stopped. This should allow sufficient time to stabilize the flowrate during low flow stop zone before closing the flow control valve.

Point Type 69: Components

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
3	Final Stop Quantity	R/W	User	UINT32	4	0 → 99999	3	1.00	Sets a target quantity at which the flow control valve closes during shutdown. This is the component preset value minus this configured quantity (based on Preset Delivery Type). **Note**: Set this to **0** (zero) to have the system calculate the final stop zone target using last five valve closure pulse samples.
4	Block Valve Delay(s)	R/W	User	UINT8	1	0 → 99	0	1.00	Sets, in seconds, the time between opening the component block valve and opening the component flow control valve during startup.
5	Pump Stop Delay	R/W	User	UINT16	2	0 → 999	30	1.00	Sets, in seconds, the time between terminating flow through the meter after closing the flow control valve (FCV) and de-energizing the pump for this component. The system uses the Pump Stop Delay in following cases: 1. Normal FCV closure due to delivery of component being completed 2. Batch halt due to non-primary alarm (severity 2 or 3) 3. Batch halt due to stop key or stop batch command from TA with 'stop key action' not set as immediate.
6	Component ID	R/W	User	String20	20	Any ASCII String	"Component #X"	1.00	Sets an identifying name for specific component. This identifies the component for display and logging purposes. Values must be printable ASCII characters.
7	Meter	R/W	User	UINT8	1	1 → 4	1	1.00	Identifies the flow meter used to measure this component. In a sequential blending application, all components flow through the same meter, one at a time.

Point Type 69: Components

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
8	K-Factor	R/W_ CNDL	User	Float	4	Any positive, non-zero, valid IEEE 754 float	1.0	1.00	Sets the linear meter constant (K-Factor) in pulses/ft3 or pulses/m3 depending on volume and mass units option in liquid preference point type. **Note**: This configuration is used when Meter Factor / K-factor Option (parameter #74 in component PT) is 0 = Single Meter Factor and Single K-factor, 1 = Meter Factor Curve with a Single K-factor)
9	Meter Factor	R/W_ CNDL	User	Float	4	0.8 → 1.2	1.0	1.00	Sets a number obtained by dividing the quantity of fluid (measured by the proving system) by the quantity indicated by the meter during proving. **Note**: The system uses this value when Meter Factor / K-factor Option (parameter #74 in component PT) is 0 (Single Meter Factor and Single K-factor).
10	Line Pack Delay (s)	R/W	User	UINT16	2	0 → 999	30	1.00	Sets the time between starting the pump for this component and opening the flow control valve when a batch starts or restarts.
11	Current Zone	R/O	System	UINT8	1	0 → 4	4	1.00	Show the flowrate zone of the component (also known as the component's "current zone") according to the delivery profile. Vaild values are: 0 = Low flow start 1 = High flow 2 = Low flow stop 3 = Lock 4 = Final Stop (i.e. normal stop)
12	Pump Contact	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	Defines the TLP which controls the product pump contact for this component. **Note**: It should point to valid DO or ACIO output status.
13	RESERVED								Reserved for future use
14	RESERVED								Reserved for future use
15	RESERVED								Reserved for future use

Point Type 69: Components

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
16	RESERVED								Reserved for future use
17	RESERVED								Reserved for future use
18	RESERVED								Reserved for future use
19	Component Preset	R/O	System	Float	4	0.0 to any positive valid IEEE 754 float	0	1.00	Indicates the component preset quantity (based on the Delivery Type) which needs to be delivered. This is set for component in the recipe or the flush component.
20	Component Remaining Qty	R/O	System	Float	4	Any valid IEEE 754 float	0	1.00	Indicates the component remaining quantity (based on Delivery Type) which remains to be delivered. When the component (regular component in recipe or flush component) is started it is set equal to component preset. As component is metered during loading, the incremental quantity (based on 'delivery type') through the meter is subtracted from comp remaining quantity.
21	Block Valve fail status	R/O	System	UINT8	1	0 → 15	0	1.00	Shows the status of block valve feedback error. Each bit indicates status of one block valve starting from LSB. Bit 0 gives the status of seq or comp 1 block valve feedback. The bit is set to 1 if block valve feedback is different from that expected, i.e. block valve output state. The Batching user program scans block valves feedback inputs after some delay when block valve output state changes (that is, it is activated during startup or de-activated during shutdown).
22	Component flush	R/O	System	Float	4	0.0 to any positive valid IEEE 754 float	0	1.00	Show the component preset quantity which is adjusted from recipe component preset to provide the flush component preset. This is calculated and set when batch gets authorized.

Point Type 69: Components

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
23	Component preset after flush	R/O	System	Float	4	0.0 to any positive valid IEEE 754 float	0	1.00	Indicates the recipe component preset quantity after adjustment is made for the flush component preset. This is calculated and set when batch gets authorized.
24	RESERVED								Reserved for future use
25	Gross Component Del Qty(Batch)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 float	0	1.00	Indicates the gross volume quantity which is delivered for current component in the batch. This resets when new batch is authorized.
26	RESERVED								Reserved for future use
27	Net Std Component Del Qty (Batch)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 float	0	1.00	Show the net standard. volume quantity which is delivered for current component in the batch. This value resets when new batch is authorized.
28	Mass Component Del Qty (Batch)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the mass quantity which is delivered for current component in the batch. This value resets when new batch is authorized.
29	RESERVED								Reserved for future use
30	Gross Component Total	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the gross volume quantity delivered for current component since the DL8000 was initialized. The value never resets. It rolls over when it crosses roll over limit.
31	RESERVED								Reserved for future use
32	Net Std Component Total	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the net standard volume quantity delivered for current component since the DL8000 was initialized. The value never resets. It rolls over when it crosses roll over limit.
33	Mass Component Total	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Indicates the mass quantity delivered for current component since the DL8000 was initialized. The value never resets. It rolls over when it crosses roll over limit.
34	RESERVED								Reserved for future use
35	RESERVED								Reserved for future use
36	RESERVED								Reserved for future use

Point Type 69: Components

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
37	RESERVED								Reserved for future use
38	RESERVED								Reserved for future use
39	RESERVED								Reserved for future use
40	RESERVED								Reserved for future use
41	RESERVED								Reserved for future use
42	RESERVED								Reserved for future use
43	RESERVED								Reserved for future use
44	Lowest component temperature	R/O	System	Float	4	Any valid IEEE 754 float	0	1.00	Shows the minimum temperature recorded for this component during loading for the current batch. It resets to 0 when new batch is authorized.
45	Lowest temperature timestamp	R/O	System	Time (UINT32)	4	Any valid time	0	1.00	Shows the timestamp when the system recorded the Lowest Component Temperature for this component. The timestamp represents the number of seconds that have elapsed since 12:00 AM. Jan. 1, 1970.
46	Highest component temperature	R/O	System	Float	4	Any valid IEEE 754 float	0	1.00	Shows the maximum temperature recorded for this component during loading for the current batch. It resets to 0 when new batch is authorized.
47	Highest temperature timestamp	R/O	System	Time (UINT32)	4	Any valid time	0	1.00	Shows the timestamp when the system recorded the Highest Component Temperature for this component was recorded. The timestamp represents the number of seconds that have elapsed since 12:00 AM. Jan. 1, 1970.
48	Lowest component pressure	R/O	System	Float	4	Any valid IEEE 754 float	0	1.00	Shows the minimum pressure recorded for this component during loading for the current batch. It resets to 0 when new batch is authorized.

Point Type 69: Components

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
49	Lowest pressure timestamp	R/O	System	Time (UINT32)	4	Any valid time	0	1.00	Shows the timestamp when the system recorded the Lowest Component Pressure for this component was recorded. The timestamp represents the number of seconds that have elapsed since 12:00 AM. Jan. 1, 1970.
50	Highest component pressure	R/O	System	Float	4	Any valid IEEE 754 float	0	1.00	Shows the maximum pressure recorded for this component during loading for the current batch. It resets to 0 when new batch is authorized.
51	Highest pressure timestamp	R/O	System	Time (UINT32)	4	Any valid time	0	1.00	Shows the timestamp when the system recorded the Highest Component Pressure for this component. The timestamp represents the number of seconds that have elapsed since 12:00 AM. Jan. 1, 1970.
52	Lowest component density	R/O	System	Float	4	Any valid IEEE 754 float	0	1.00	Shows the minimum density recorded for this component during loading for the current batch. The value resets to 0 when new batch is authorized.
53	Lowest density timestamp	R/O	System	Time (UINT32)	4	Any valid time	0	1.00	Shows the timestamp when the system recorded the Lowest Component Density for this component. The timestamp represents the number of seconds that have elapsed since 12:00 AM. Jan. 1, 1970.
54	Highest component density	R/O	System	Float	4	Any valid IEEE 754 float	0	1.00	Shows the maximum density recorded for this component during loading for the current batch. This value resets to 0 when new batch is authorized.
55	Highest density timestamp	R/O	System	Time (UINT32)	4	Any valid time	0	1.00	Shows the timestamp when the system recorded the Highest Component Density for this component. The timestamp represents the number of seconds that have elapsed since 12:00 AM Jan. 1, 1970.

Point Type 69: Components

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
56	Stop flow rate	R/W_ CNDL	User	Float	4	0 → 99999.9	150	1.00	Sets the stop rate for component. The system uses this value for inline blending during low flow stop zone and for the delivery of the flush component. This is the flowrate at which the system delivers this component during the component's configured low-flow stop quantity at the end of an in-line batch. Thus, the final closure of the flow control valve is always from the same flowrate so that valve closure averaging works correctly, independently of the individual component blend percentages in the recipes. This also means that the overall flowrate at the end of a batch is the sum of the stop rates of any flowing components. It is also used for the delivery of flush component. **Note**: This target flowrate is always of indicated flowrate type to provide valve closure repeatability and accuracy.
57	LP High Flow rate	R/W	User	Float	4	0 → 99999.9	200	1.00	Sets the target flowrate in high flow zone of this component if it is a low proportion component (defined as **1** in Delivery Seq or Low Proportion (68,0,16) in recipe PT. **Note**: This target flowrate is always delivery type (63,0,29) based flowrate.
58	RESERVED								Reserved for future use
59	Actual component %	R/O	System	Float	4	0 → 99.99	0	1.00	Shows the actual ratio of component in current batch being delivered. The value resets when new batch is authorized.
60	RESERVED								Reserved for future use

Point Type 69: Components

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
61	Avg Component Temp. (FWA)	R/O	System	Float	4	Any valid IEEE 754 float	0	1.00	Shows the flow weighted average (FWA) component temperature value, calculated when the batch is in progress. This value resets to zero when a new batch is authorized.
62	RESERVED								Reserved for future use
63	RESERVED								Reserved for future use
64	Seq or Comp 1 Block Valve Output	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	Sets the block valve output status contact TLP. For **sequential batch** this parameter defines the block valve output (on/off) which controls the delivery of this component into the common pipe. It should point to DO or ACIO output status.
65	RESERVED								Reserved for future use
66	RESERVED								Reserved for future use
67	RESERVED							1.00	Reserved for future use
68	Seq or Comp 1 Block Valve Feedbac	R/W	User	TLP	3	Any valid TLP	0,0,0	1.00	Sets the block valve feedback input status TLP, which needs to be monitored to check whether the block valve output 1 is in the correct state. If feedback input does not shows correct state then block valve fail alarm is raised. It should be configured only if block valve output 1 of this component is configured.
69	RESERVED								Reserved for future use.
70	RESERVED								Reserved for future use
71	RESERVED								Reserved for future use
72	Avg component pressure (FWA)	R/O	System	Float	4	Any valid IEEE 754 float	0	1.00	Shows the flow weighted average (FWA) component pressure value, calculated when the batch is in progress. This value resets to zero when a new batch is authorized.
73	Blend Percent Error	R/O	System	Float	4	Any valid IEEE 754 float	0	1.20	Shows the actual stream percentage error with respect to ideal component percentage. This value updates in case of Inline blending.

Point Type 69: Components

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
74	Meter Factor/K-factor Option	R/W_ CNDL	User	UINT8	1	0 → 1	0	1.00	Sets how the meter factor and k-factor should interact. Valid values are: 0 = Single Meter Factor and Single K-factor, 1 = Meter Factor Curve with a Single K-factor.
75	Meter Factor/K-factor 1	R/W_ CNDL	User	Float	4	0.8 → 1.2 [If Meter Factor/K-Factor Option = 1] Any positive, non-zero, valid IEEE 754 Float [If Meter Factor/K-Factor Option = 2]	1.0	1.00	Sets the Meter Factor for the associated flow rate (69,0,76) or K-factor for associated frequency (69,0,76).
76	Flowrate/Frequency 1	R/W_ CNDL	User	Float	4	0.0 → 999999.0	0.0	1.00	Sets the flowrate for the associated Meter Factor **Note**: This flowrate is always of indicated type.
77	Meter Factor/K-factor 2	R/W_ CNDL	User	Float	4	0.8 → 1.2 [If Meter Factor/K-Factor Option = 1] Any positive, non-zero, valid IEEE 754 Float [If Meter Factor/K-Factor Option = 2]	1.0	1.00	Sets the Meter Factor for the associated flow rate (69,0,78) or K-factor for associated frequency (69,0,78).
78	Flowrate/Frequency 2	R/W_ CNDL	User	Float	4	0.0 → 999999.0	0.0	1.00	Sets the flowrate for the associated Meter Factor **Note**: This flowrate is always of indicated type.
79	Meter Factor/K-factor 3	R/W_ CNDL	User	Float	4	0.8 → 1.2 [If Meter Factor/K-Factor Option = 1] Any positive, non-zero, valid IEEE 754 Float [If Meter Factor/K-Factor Option = 2]	1.0	1.00	Sets the Meter Factor for the associated flow rate (69,0,80) or K-factor for associated frequency (69,0,80).
80	Flowrate/Frequency 3	R/W_ CNDL	User	Float	4	0.0 → 999999.0	0.0	1.00	Sets the flowrate for the associated Meter Factor. **Note**: This flowrate is always of indicated type.

Point Type 69: Components

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
81	Meter Factor/K-factor 4	R/W_ CNDL	User	Float	4	0.8 → 1.2 [If Meter Factor/K-Factor Option = 1] Any positive, non-zero, valid IEEE 754 Float [If Meter Factor/K-Factor Option = 2]	1.0	1.00	Sets the Meter Factor for the associated flowrate (69,0,82) or K-factor for associated frequency (69,0,82).
82	Flowrate/Frequency 4	R/W_ CNDL	User	Float	4	0.0 → 999999.0	0.0	1.00	Sets the flowrate for the associated Meter Factor. **Note**: This flowrate is always of indicated type.
83	Meter Factor/K-factor 5	R/W_ CNDL	User	Float	4	0.8 → 1.2 [If Meter Factor/K-Factor Option = 1] Any positive, non-zero, valid IEEE 754 Float [If Meter Factor/K-Factor Option = 2]	1.0	1.00	Sets the Meter Factor for the associated flowrate (parameter #84) or K-factor for associated frequency (69,0,84).
84	Flowrate/Frequency 5	R/W_ CNDL	User	Float	4	0.0 → 999999.0	0.0	1.00	Sets the flowrate for the associated Meter Factor. **Note**: This flowrate is always of indicated type.
85	Meter Factor/K-factor 6	R/W_ CNDL	User	Float	4	0.8 → 1.2 [If Meter Factor/K-Factor Option = 1] Any positive, non-zero, valid IEEE 754 Float [If Meter Factor/K-Factor Option = 2]	1.0	1.00	Sets the Meter Factor for the associated flow rate (69,0,86) or K-factor for associated frequency (69,0,86).
86	Flowrate/Frequency 6	R/W_ CNDL	User	Float	4	0.0 → 999999.0	0.0	1.00	Sets the flowrate for the associated Meter Factor. **Note**: This flowrate is always of indicated type.
87	Meter Factor/K-factor 7	R/W_ CNDL	User	Float	4	0.8 → 1.2 [If Meter Factor/K-Factor Option = 1] Any positive, non-zero, valid IEEE 754 Float [If Meter Factor/K-Factor Option = 2]	1.0	1.00	Sets the Meter Factor for the associated flowrate (69,0,88) or K-factor for associated frequency (69,0,88).

Point Type 69: Components

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
88	Flowrate/Frequency 7	R/W_ CNDL	User	Float	4	0.0 → 999999.0	0.0	1.00	Sets the flowrate for the associated Meter Factor. **Note**: This flowrate is always of indicated type.
89	Meter Factor/K-factor 8	R/W_ CNDL	User	Float	4	0.8 → 1.2 [If Meter Factor/K-Factor Option = 1] Any positive, non-zero, valid IEEE 754 Float [If Meter Factor/K-Factor Option = 2]	1.0	1.00	Sets the Meter Factor for the associated flowrate (69,0,90) or K-factor for associated frequency (69,0,90).
90	Flowrate/Frequency 8	R/W_ CNDL	User	Float	4	0.0 → 999999.0	0.0	1.00	Sets the flowrate for the associated Meter Factor. **Note**: This flowrate is always of indicated type.
91	Meter Factor/K-factor 9	R/W_ CNDL	User	Float	4	0.8 → 1.2 [If Meter Factor/K-Factor Option = 1] Any positive, non-zero, valid IEEE 754 Float [If Meter Factor/K-Factor Option = 2]	1.0	1.00	Sets the Meter Factor for the associated flowrate (69,0,92) or K-factor for associated frequency (69,0,92).
92	Flowrate/Frequency 9	R/W_ CNDL	User	Float	4	0.0 → 999999.0	0.0	1.00	Sets the flowrate for the associated Meter Factor. **Note**: This flowrate is always of indicated type.
93	Meter Factor/K-factor 10	R/W_ CNDL	User	Float	4	0.8 → 1.2 [If Meter Factor/K-Factor Option = 1] Any positive, non-zero, valid IEEE 754 Float [If Meter Factor/K-Factor Option = 2]	1.0	1.00	Sets the Meter Factor for the associated flowrate (69,0,94) or K-factor for associated frequency (69,0,94).
94	Flowrate/Frequency 10	R/W_ CNDL	User	Float	4	0.0 → 999999.0	0.0	1.00	Sets the flowrate for the associated Meter Factor. **Note**: This flowrate is always of indicated type.

Point Type 69: Components

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
95	Meter Factor/K-factor 11	R/W_ CNDL	User	Float	4	0.8 → 1.2 [If Meter Factor/K-Factor Option = 1] Any positive, non-zero, valid IEEE 754 Float [If Meter Factor/K-Factor Option = 2]	1.0	1.00	Sets the Meter Factor for the associated flowrate (69,0,96) or K-factor for associated frequency (69,0,96).
96	Flowrate/Frequency 11	R/W_ CNDL	User	Float	4	0.0 → 999999.0	0.0	1.00	Sets the flowrate for the associated Meter Factor. **Note**: This flowrate is always of indicated type.
97	Meter Factor/K-factor 12	R/W_ CNDL	User	Float	4	0.8 → 1.2 [If Meter Factor/K-Factor Option = 1] Any positive, non-zero, valid IEEE 754 Float [If Meter Factor/K-Factor Option = 2]	1.0	1.00	Sets the Meter Factor for the associated flowrate (69,0,98) or K-factor for associated frequency (69,0,98).
98	Flowrate/Frequency 12	R/W_ CNDL	User	Float	4	0.0 → 999999.0	0.0	1.00	Sets the flowrate for the associated Meter Factor. **Note**: This flowrate is always of indicated type.
99	Avg component observed density (FWA)	R/O	System	Float	4	Any valid IEEE 754 float	0	1.21	Shows the flow weighted average (FWA) observed density value for component when flowing through meter. It is calculated when the batch is in progress. The value resets to zero when a new batch is authorized.
100	Avg component base density (FWA)	R/O	System	Float	4	Any valid IEEE 754 float	0	1.21	Shows the flow weighted average (FWA) base density value for component when flowing through meter. It is calculated when the batch is in progress. The value resets to zero when a new batch is authorized.
101	Avg Component CTL (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.21	Shows the flow weighted average (FWA) CTL value for component when flowing through meter. It is calculated when the batch is in progress. The value resets to zero when a new batch is authorized.

Point Type 69: Components

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
102	Avg Component CPL (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.21	Shows the flow weighted average (FWA) CPL value for component when flowing through meter. It is calculated when the batch is in progress. The value resets to zero when a new batch is authorized.
103	Avg Component K-factor (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.21	Shows the flow weighted average (FWA) k-factor for component when flowing through meter. It is calculated when the batch is in progress. The value resets to zero when a new batch is authorized.
104	Avg Component Meter Factor (FWA)	R/O	System	Float	4	Any valid IEEE 754 Float	0	1.21	Shows the flow weighted average (FWA) meter factor for component when flowing through meter. It is calculated when the batch is in progress. The value resets to zero when a new batch is authorized.
105	Master Meter Factor	R/W_ CNDL	User	Float	4	0.5->2.0	1.0	2.34	Master meter factor value. This is user entered value. The overall meter factor deviation % will be checked against this value as Low Limit= Master MF - [Master MF * Master MF %/100] High Limit = Master MF + [Master MF * Master MF %/100] If the meter factor not withn this range then MF deviation alarm will be trigerred (This is added to satisfy Industry Canada requirement)
106	Master MF %	R/W_ CNDL	User	Float	4	0.0->9.99	2.0	2.34	Expected overall MF deviation % (This is added to satisfy Industry Canada requirement)

3.4.10 Point Type 70: Liquid Preference Parameters

Description: Point type 70 provides parameters for liquid station and meters.

Number of Logical Points: 1 logical point for each liquid preference.

Storage Location: Point type 70 is saved to internal configuration memory.

Table 3-11: Point Type 70, Liquid Preference Parameters

Point Type 70: Liquid Preference Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Differential Pressure Units Option	R/W CNDL	User	UINT8	1	0 → 3	0	1.11	Sets the engineering units for differential pressure values. Valid values are: 0 = In H2O 1 = kPa 2 = mbar 3 = mm H2O.
1	Pressure Units Option	R/W CNDL	User	UINT8	1	0 → 3	0	1.11	Sets the engineering units for pressure values. Valid values are (all units are in gauge): 0 = PSI 1 = kPa 2 = bar 3 = kg/cm2.
2	Temperature Units Option	R/W CNDL	User	UINT8	1	0 → 1	0	1.11	Sets the engineering units for temperature values. Valid values are: 0 = Deg F 1 = Deg C.
3	Density in Units Option	R/W CNDL	User	UINT8	1	0 → 6	0	1.11	Sets the engineering units for density values. Valid values are: 0 = kg/m3 1 = g/cc 2 = lb/ft3 3 = lb/bbl 4 = lb/gal 5 = relative density 6 = API gravity.

Point Type 70: Liquid Preference Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
4	Linear Units Option	R/W CNDL	User	UINT8	1	0 → 1	0	1.11	Sets the engineering units for orifice and plate diameters and prover wall thickness. Valid values are: 0 = Inches 1 = mm .
5	Viscosity Units Option	R/W CNDL	User	UINT8	1	0 → 1	0	1.11	Sets the engineering units for fluid viscosity. Valid values are: 0 = Lb/ft-sec 1 = centipoise.
6	Volume Units Option	R/W CNDL	User	UINT8	1	0 → 5	0	1.11	Sets the engineering units for volume values. Valid values are: 0 = Bbls 1 = MCF 2 = km3 3 = Gallons (US) 4 = ft3 5 = m3 6 = liters.
7	Mass Units Option	R/W CNDL	User	UINT8	1	0 → 3	0	1.11	Sets the engineering units for mass values. Valid values are: 0 = lbs 1 = kg 2 = tons (short) 3 = tonnes.
8	Flow Rate Option	R/W CNDL	User	UINT8	1	0 → 3	0	1.11	Sets the time basis for calculating flowrates. Valid values are: 0 = per day 1 = per hour 2 = per minute 3 = per second.
9	Calculation Period	R/W CNDL	User	Float	4	0.25 → 5	1.0	1.11	Sets, in seconds, the amount of time between volume correction factor calculations.
10	Program Status	R/W CNDL	User	UINT8	1	0 → 2	0	1.11	Sets the current status of the Liquid Calcs program. Valid values are: 0 = Program not running 1 = Program running 2 = License key not available.
11	Table Units	R/W CNDL	User	UINT8	1	0 → 2	0	1.11	Sets the correction table to use. Valid values are: 0 = Kg/m3 1 = Relative Density 2 = API Gravity

Point Type 70: Liquid Preference Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	Rollover Value	R/O	System	Double	8	-	2^31	1.21	Shows the value at which all on-going accumulators roll over.
13	Barrels Label	R/W	System	AC7	7	Any valid string	Bbl	1.14	Sets the unit label for Barrels.
14	MCF Label	R/W	System	AC7	7	Any valid string	Bbl	1.14	Sets the unit label for millions of cubic feet.
15	K Cubic Meters Label	R/W	System	AC7	7	Any valid string	Bbl	1.14	Sets the unit label for thousands of cubic meters
16	Gallons Label	R/W	System	AC7	7	Any valid string	Bbl	1.14	Sets the unit label for gallons.
17	Cubic Feet Label	R/W	System	AC7	7	Any valid string	Bbl	1.14	Sets the unit label for cubic feet.
18	Cubic Meters Label	R/W	System	AC7	7	Any valid string	Bbl	1.14	Sets the unit label for cubic meters.
19	Liters Label	R/W	System	AC7	7	Any valid string	Bbl	1.14	Sets the unit label for liters.
20	Pounds Label	R/W	System	AC7	7	Any valid string	Bbl	1.14	Sets the unit label for pounds.
21	Kilograms Label	R/W	System	AC7	7	Any valid string	Bbl	1.14	Sets the unit label for kilograms.
22	Ton Label	R/W	System	AC7	7	Any valid string	Bbl	1.14	Sets the unit label for tons.
23	Tonne Label	R/W	System	AC7	7	Any valid string	Bbl	1.14	Sets the unit label for tonnes.
24	Calculation Alarm Status	R/O	System	UINT8	1	0 → 1	0	2.00	Indication that there has been an error in the flow calculation. Valid values are: 0 = Normal 1 = Error
25	Calculation Alarm Reset	R/W	Both	UINT8	1	0 → 1	0	2.00	Option to reset the Calculation Alarm Status (parameter #24). Setting this parameter will clear the Calculation Alarm Status and then clear the Calculation Alarm Reset. Valid values are: 0 = No action 1 = Reset.

3.4.11 Point Type 71: Liquid Station Parameters

Description: Point type 71 provides parameters for a station of liquid meter runs.

Number of Logical Points: 4 logical points for liquid stations.

Storage Location: Point type 71 is saved to internal configuration memory.

Table 3-12: Point Type 71, Liquid Station Parameters

Point Type 71: Liquid Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"Station X" where X is the Station number	1.11	Sets an identification name for specific station. Values must be printable ASCII characters.
1	Product	R/W	User	UINT8	1	0 → 23	0	1.14	Sets which product is currently flowing through this station. The value is the logical number of the product point type.
2	Alarming Option	R/W	User	UINT8	1	0 → 5	0	1.11	If enabled, generates and sends alarms to the Alarm Log. Valid values are: 0 = Disabled 1 = Enabled for Indicated Volume Flow Rate (parameter #18) 2 = Enabled for Gross Volume Flow Rate (parameter #20) 3 = Enabled for Gross Standard Volume Flow Rate (parameter #22) 4 = Enabled for Net Standard Volume Flow Rate (parameter #24) 5 = Enabled for Mass Flow Rate (parameter #26).
3	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.11	Sets whether a SRBX alarm occurs if an alarm condition clears. Valid values are: 0 = SRBX on Clear Disabled 1 = SRBX on Clear Enabled.
4	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.11	Sets whether a SRBX alarm occurs if an alarm condition occurs. Valid values are:b 0 = SRBX on Set Disabled 1 = SRBX on Set Enabled.

Point Type 71: Liquid Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.11	
5.0	Low Alarm			Bit 0			0	1.11	Sets an alarm if the flowrate selected for alarming (71,0,2) is less than or equal to the Low Alarm Flow (71,0,6). This alarm is cleared if the flow rate selected for alarming is greater than the Low Alarm Flow (71,0,6) plus the alarm deadband (71,0,8).
5.1	Not Used			Bit 1			0	1.11	Not used.
5.2	High Alarm			Bit 2			0	1.11	Sets an alarm if the flowrate selected for alarming (see 71,0,2) is greater than or equal to the High Alarm Flow (71,0,7). This alarm clears if the flowrate selected for alarming is less than the High Alarm Flow (71,0,7) minus the alarm deadband (71,0,8).
5.3	Not Used			Bit 3			0	1.11	Not Used
5.4	Not Used			Bit 4			0	1.11	Not Used
5.5	Not Used			Bit 5			0	1.11	Not Used
5.6	No Flow Alarm			Bit 6			0	1.11	Sets an alarm if the flowrate selected for alarming (see 71,0,2) is equal to zero. This alarm clears if the flow rate selected for alarming is greater than 0.
5.7	Not Used			Bit 7			0	1.11	Not Used
6	Low Alarm Flow	R/W	User	Float	4	Any valid IEEE 754 float	–1000.0	1.11	Sets an alarm value for Low Alarm in units of selected flow rate (71,0,2).
7	High Alarm Flow	R/W	User	Float	4	Any valid IEEE 754 float	100,000.0	1.11	Sets an alarm value for High Alarm in units of selected flow rate (71,0,2).
8	Alarm Deadband	R/W	User	Float	4	Any valid IEEE 754 float	100.0	1.11	Sets a value that the selected flowrate (71,0,2) must be above the low alarm value (71,0,6) or below the high alarm value (71,0,8) before the associated alarm clears.

Point Type 71: Liquid Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
9	Base Temperature Option	R/W	User	UINT8	1	0 → 4	0	1.11	Sets a reference temperature the net volume. Valid values are: 0 = 60 Deg F 1 = 68 Deg F 2 = 15 Deg C 3 = 20 Deg C 4 = 30 Deg C 5 = Not supported at this time
10	RESERVED								Reserved for future use
11	Measured Density Option	R/W CNDL	User	UINT8	1	0 → 2	0	1.11	Indicates whether the station has a densitometer(s) that provides a density for all the meters in the station. Valid values are: 0 = No station densitometer 1 = Single station densitometer present 2 = Not supported at this time. .
12	Density A Logical	R/W CNDL	User	UINT8	1	0 → 3	0	1.11	Specifies the densitometer point from which to retrieve the density.
13	RESERVED								Reserved for future use
14	RESERVED								Reserved for future use
15	RESERVED								Reserved for future use
16	Observed Density	R/O	System	Float	4	>0.0 → Any positive valid IEEE 754 float	0.0	1.11	Shows the current value of the fluid density observed at the station header under flowing conditions. Units are defined by Density Units option (70,0.3).
17	Base Density	R/O	System	Float	4	>0.0 → Any positive valid IEEE 754 float	737.0	1.11	Shows the current value of the fluid density at the selected base temperature and equilibrium pressure. Units are defined by Density Units option (70,0,3).
18	Indicated Volume Flow Rate	R/O	System	Double	8	Any valid IEEE 754 double	0.0	1.11	Shows the actual volume flow rate as indicated by the meter. Units are defined by Volume Units option (70,0,5) and Flow Rate option (70,0,8).
19	Indicated Volume Total	R/O	System	Double	8	Any valid IEEE 754 double	0.0	1.11	Indicates the volumetric total in volume units selected. Units are defined by Volume Units option (70,0,5).

Point Type 71: Liquid Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
20	Gross Volume Flow Rate	R/O	System	Double	8	Any valid IEEE 754 double	0.0	1.11	Shows the actual volume flow rate as indicated by the meter. Units are defined by Volume Units option (70,0,5) and Flow Rate option (70,0,8).
21	Gross Volume Total	R/O	System	Double	8	Any valid IEEE 754 double	0.0	1.11	Shows the volumetric total in volume units selected. Units are defined by volume units option (70,0,5). Rollover is defined by 70,0,11.
22	Gross Standard Volume Flow Rate	R/O	System	Double	8	Any valid IEEE 754 double	0.0	1.11	Shows the volume flow rate at base conditions, also corrected for meter performance. Units are defined by Volume Units option (70,0,5) and flow rate option (70,0,8).
23	Gross Standard Volume Total	R/O	System	Double	8	Any valid IEEE 754 double	0.0	1.11	Shows the ongoing accumulation of volume at base conditions, also corrected for meter performance. Units are defined by Volume Units option (70,0,5). Rollover is defined by 70,0,11.
24	Net Standard Volume Flow Rate	R/O	System	Double	8	Any valid IEEE 754 double	0.0	1.11	Shows the gross standard volume flow rate corrected for non-merchantable quantities such as sediment and water. Applies only to crude oil applications. This parameter is identical to Gross Standard Volume Flow Rate (parameter #17) for other fluid types. Units are defined by volume units option (70,0,5) and flow rate option (70,0,8).
25	Net Standard Volume Total	R/O	System	Double	8	0.0→Any positive valid IEEE 754 double	0.0	1.11	Shows the gross standard volume total corrected for non-merchantable quantities such as sediment and water. Applies only to crude oil applications. This parameter is identical to Gross Standard Volume Total (parameter #18) for other fluid types. Units are defined by volume units option (70,0,5). Rollover is defined by 70,0,11.

Point Type 71: Liquid Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
26	Mass Rate	R/O	System	Double	8	0.0→Any positive valid IEEE 754 double	0.0	1.11	Shows the mass flow rate. Units are defined by mass units option (70,0,6) and flow rate option (point 70,0,8).
27	Mass Total	R/O	System	Double	8	0.0→Any positive valid IEEE 754 float	0.0	1.11	Shows the total accumulation of mass since the last contract hour in mlb or tonnes. Rollover is defined by 70,0,11.
28	Temperature Correction Table	R/O	System	UINT8	1	0 → 21	20	1.11	Shows which temperature correction table has been selected based on the product type, density units, and base temperature. Valid values are: 0 = 1980 API2540 Table 5/6A 1 = 1980 API2540 Table 5/6B 2 = 1982 API2540 Table 5/6D 3 = 1980 API2540 Table 6C 4 = 1980 API2540 Table 23/24A 5 = 1980 API2540 Table 23/24B 6 = 1982 API2540 Table 23/24D 7 = TP27 Table 23/24E 8 = 1980 API2540 Table 24C 9 = 1980 API2540 Table 53/54A 10 = 1980 API2540 Table 53/54B 11 = 1982 API2540 Table 53/54D 12 = 1982 API2540 Table 53/54E 13 = 1980 API2540 Table 54C 14 = ISO / IP-3/ Table 59A/60A 15 = ISO / IP-3. Table 59/60B 16 = ISO / IP-3/ Table 59/60D 17 = TP27 Table 59E/60E 18 = Procedure 11.1.6 2004 19 = Procedure 11.1.7 2004 20 = Invalid Table 21 = Ethanol
29	Pressure Correction Table	R/O	System	UINT8	1	0 → 5	o	1.11	Shows which pressure correction table has been selected based on the density and temperature units. Valid values are: 0 = User compressibility 1 = 1984 API2540 Table 11.2.1 2 = 1984 API2540 Table 11.2.1M 3 = 1986 API2540 Table 11.2.2 4 = 1986 API2540 Table 11.2.2M 5 = None (Ethanol).

Point Type 71: Liquid Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
30	BSW Volume Rate	R/O	System	Double	8	Any valid IEEE 754 double	0.0	1.11	Shows the volume flow rate of non-merchantable quantities such as sediment and water. Applies only to crude oil applications. Units are defined by Volume Units option (70,0,6) and flow rate option (70,0,9).
31	BSW Volume Total	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the volume total of non-merchantable quantities such as sediment and water. Applies only to crude oil applications. Units are defined by Volume Units option (70,0,6) and Flow Rate option (70,0,9).
32	Indicated Volume Today	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the volumetric total for the current contract day in volume units selected. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
33	Gross Volume Today	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume at flowing conditions, corrected for meter factor, for the current contract day in volume units selected. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
34	Gross Standard Volume Today	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume at base conditions, corrected for meter performance, for the current contract day. Units are defined by volume units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
35	Net Standard Volume Today	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume at base conditions, corrected for meter performance and BSW, for the current contract day. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).

Point Type 71: Liquid Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
36	BSW Volume Today	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume of non-merchantable quantities such as sediment and water for the current contract day. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
37	Mass Today	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of mass for the current contract day. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
38	Indicated Volume Yesterday	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the volumetric total for the previous contract day in volume units selected. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
39	Gross Volume Yesterday	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume at flowing conditions, corrected for meter factor, for the previous contract day in volume units selected. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
40	Gross Standard Volume Yesterday	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume at base conditions, corrected for meter performance, for the previous contract day. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
41	Net Standard Volume Yesterday	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume at base conditions, corrected for meter performance and BSW, for the previous contract day. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).

Point Type 71: Liquid Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
42	BSW Volume Yesterday	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume of non-merchantable quantities such as sediment and water for the previous contract day. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
43	Mass Yesterday	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of mass for the previous contract day. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
44	Indicated Volume This Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the volumetric total for the current month in volume units selected. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
45	Gross Volume This Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume at flowing conditions, corrected for meter factor, for the current month in volume units selected. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
46	Gross Standard Volume This Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume at base conditions, corrected for meter performance, for the current month. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
47	Net Standard Volume This Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume at base conditions, corrected for meter performance and BSW, for the current month. Units are defined by volume units option (point type 70, parameter #6). Rollover occurs at the time indicated (e.g., end of day, end of month).

Point Type 71: Liquid Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
48	BSW Volume This Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume of non-merchantable quantities such as sediment and water for the current month. Units are defined by volume units option (point type 70, parameter #6). Rollover occurs at the time indicated (e.g., end of day, end of month).
49	Mass This Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of mass for the current month. Units are defined by mass units option (point type 70, parameter #7). Rollover occurs at the time indicated (e.g., end of day, end of month).
50	Indicated Volume Previous Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the volumetric total for the current contract day in volume units selected. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
51	Gross Volume Previous Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume at flowing conditions, corrected for meter factor, for the current contract day in volume units selected. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
52	Gross Standard Volume Previous Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume at base conditions, corrected for meter performance, for the current contract day. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
53	Net Standard Volume Previous Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume at base conditions, corrected for meter performance and BSW, for the current contract day. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).

Point Type 71: Liquid Station Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
54	BSW Volume Previous Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of volume of non-merchantable quantities such as sediment and water for the current contract day. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).
55	Mass Previous Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.11	Shows the accumulation of mass for the current contract day. Units are defined by Volume Units option (70,0,6). Rollover occurs at the time indicated (e.g., end of day, end of month).

3.4.12 Point Type 72: Product Parameters

Description: Point type 72 provides parameters defining liquid product streams.

Number of Logical Points: 5 logical points.

Storage Location: Point type 72 is saved to internal configuration memory.

Table 3-13: Point Type 72, Product Parameters

Point Type 72: Product Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"Product X" where X is the logical number	1.11	Sets an identification name for specific station. Values must be printable ASCII characters.
1	Fluid Type	R/W	User	UINT8	1	0 → 9	0	1.11	Sets the type of fluid for this product. Valid values are: 0 = Crude Oil 1 = Gasoline 2 = Jet Fuel 3 = Fuel Oil 4 = Lube Oil 5 = Special Applications (user-defined Alpha) 6 = Light Hydrocarbons 7 = Transition Products 8 = Product out of range 9 = Ethanol
2	API Standard Version	R/W CNDL	User	UINT8	1	0 → 2	1	1.11	Sets which version of the API calculation standard to use. Valid values are: 0 = Not supported 1 = 1980 2 = 2004
3	Light Hydrocarbon Standard Version	R/W CNDL	User	UINT8	1	0 → 3	0	1.11	Sets which standard to use for calculating a temperature correction factor for light hydrocarbons. Valid values are: 0 = Reserved 1 = Reserved 2 = Reserved 3 = GPA TP-27

Point Type 72: Product Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
4	Compressibility Option	R/W CNDL	User	UINT8	1	0 → 3	0	1.11	Sets what method to use for calculating the product's compressibility. Valid values are: 0 = Program determines method based on density of product and temperature units 1 = API 11.2.1 calculation 2 = API 11.2.2 calculation 3 = User-defined compressibility. **Note**: This selection is valid **only** if you select **1** (the 1980 version of the API MPMS Chapter 11.1 standard) for API Standard (72,0,2).
5	Compressibility Factor	R/W CNDL	User	Float	4	0 → Any valid IEEE 754 float	0.00000448	1.11	Sets the value of compressibility factor for this product. **Note**: You can write this value only if you select **3** (User Defined Compressibility) for Compressibility Options (72,0,4).
6	Equilibrium/Base Pressure	R/W CNDL	User	Float	4	>0.0 → 2.147,484	0.0	1.11	Sets the equilibrium (bubble point) pressure for the current product in psig or kPa (gauge). The equilibrium pressure is the minimum pressure at which bubbles of gas appear in a liquid.
7	Alpha Coefficient	R/W CNDL	User	Float	4	>0.0 → 2.147,484	1.0	1.11	Sets an alpha coefficient. **Note**: This value is used **only** if you select **5** (Special Applications) in Fluid Type (72,0,1).
8	Base Density	R/W CNDL	User	Float	4	>0.0 → Any positive valid IEEE 754 float	737.0	1.11	Sets the base density of the product at contract temperature and pressure. Density units based on the Base Density Type (70,0,11).
9	Low Density Alarm Limit	R/W	User	Float	4	>0.0 → Any positive valid IEEE 754 float	0.0	1.11	Sets the value below which the system determines a density failure has occurred. Units defined by Station Density units option (70,0,5).
10	High Density Alarm Limit	R/W	User	Float	4	>0.0 → Any positive valid IEEE 754 float	1200.0	1.11	Sets the value above which the system determines a density failure has occurred. Units defined by Station Density units option (point type 141, parameter #5).

Point Type 72: Product Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
11	Ethanol Table Option	R/W CNDL	User	UINT8	1	0 → 1	0	2.20	Sets the calculation used then the Fluid Type is Ethanol. Valid values are: 1 = OIML R22 International Alcholometric Tables 1972 2 = ABNT NBR-5992
12	Ethanol Mass Percentage	R/W CNDL	User	Float	4	0.0 → 100.0	0.0	2.20	Sets the alcoholic strength by mass, expressed as a percentage. The system uses this value when the Fluid Type is Ethanol.

3.4.13 Point Type 73: Liquid Meter Parameters

Description: Point type 73 defines parameters for liquid turbine meters.

Number of Logical Points: 1 logical point for each active turbine meter.

Storage Location: Point type 73 is saved to internal configuration memory.

Table 3-14: Point Type 73, Liquid Meter

Point Type 73: Liquid Meter

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Identification	R/W	User	String10	10	0x20 → 0x7E for each ASCII character	"LiqTurb X" where X is the logical number	1.13	Sets an identifying name for specific Liquid Linear Meter Run. Values must be printable ASCII characters.
1	Point Description	R/W	User	String30	30	0x20 → 0x7E for each ASCII character	" "	1.13	Sets a descriptive name for specific Meter Run. Values must be printable ASCII characters.
2	Station number	R/W	User	UINT8	1	0 → 5	0	1.13	Sets the station association for this meter run. This parameter indicates the logical number of the liquid station (point type 141).
3	Mass Option	R/W CNDL	User	UINT8	1	0 → 1	0	1.13	Indicates whether the flow meter input provides an indicated volume or a mass value: Valid values are: 0 = Indicated Volume 1 = Mass.
4	Flow Option	R/W	User	UINT8	1	0 → 1	1	1.13	Sets whether flow should be calculated and accumulated for this meter point. Disabling the flow calculation would normally only be done if the flow meter allows bi-directional flow and the flow is currently in the opposite direction from the direction of flow this point is measuring. Valid values are: 0 = Disable calculation 1 = Enable calculation
5	RESERVED								Reserved for future use
6	RESERVED								Reserved for future use.

Point Type 73: Liquid Meter

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
7	Alarming Option	R/W	User	UINT8	1	0 → 5	0	1.13	Generates alarms and sends them to the Alarm Log. Valid values are: 0 = Disabled 1 = Enabled for Indicated Volume Flow Rate (parameter #27) 2 = Enabled for Gross Volume Flow Rate (parameter #29) 3 = Enabled for Gross Standard Volume Flow Rate (parameter #31) 4 = Enabled for Net Standard Volume Flow Rate (parameter #33) 5 = Enabled for Mass Flow Rate (parameter #35).
8	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.13	Sets a SRBX alarm if an alarm condition clears. Valid values are: 0 = Disable SRBX on clear 1 = Enable SRBX on clear
9	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.13	Sets a SRBX alarm if an alarm condition occurs. Valid values are: 0 = Disable SRBX on set 1 = Enable SRBX on set
10	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.13	
10.0	Low Alarm			Bit 0			0	1.13	Sets alarm if the Flow Rate per Day (point type 116, parameter #0) is less than or equal to the Low Alarm Flow (parameter #7). This alarm clears if the Flow Rate per Day (point type 116, parameter #0) is greater than the Low Alarm Flow (parameter #7) plus the alarm deadband (parameter #9).
10.1	Not Used			Bit 1			0	1.13	Not used
10.2	High Alarm			Bit 2			0	1.13	Sets alarm if the Flow Rate per Day (point type 116, parameter #0) is greater than or equal to the High Alarm Flow (parameter #8). This alarm clears if the Flow Rate per Day (point type 116, parameter #0) is less than the High Alarm Flow (parameter #8) minus the alarm deadband (parameter #9).
10.3	Not Used			Bit 3			0	1.13	Not used
10.4	Not Used			Bit 4			0	1.13	Not used
10.5	Not Used			Bit 5			0	1.13	Not used

Point Type 73: Liquid Meter

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
10.6	No Flow Alarm			Bit 6			0	1.13	If set, then no flow conditions are present and the Flow Rate per Day (point type 116, parameter #0) is zero. If clear, then flowing conditions exist and the Flow Rate per Day (point type 116, parameter #0) is not zero.
10.7	Manual Inputs Alarm			Bit 7			0	1.13	If set, then one of the Uncorrected Flow Rate TLP (parameter #13), SP TLP (parameter #15), or TMP TLP (parameter #17) is set to Manual (0,0,0). If clear, then the Uncorrected Flow Rate TLP (parameter #13), SP TLP (parameter #15), and TMP TLP (parameter #17) are not set to Manual.
11	Low Alarm Flow	R/W	User	Float	4	Any valid IEEE 754 float	–1000.0	1.13	Sets an alarm value for Low Alarm in mft^3/day or km^3/day.
12	High Alarm Flow	R/W	User	Float	4	Any valid IEEE 754 float	100,000.0	1.13	Sets an alarm value for High Alarm in mft^3/day or km^3/day.
13	Alarm Deadband	R/W	User	Float	4	Any valid IEEE 754 float	100.0	1.13	Sets the value that the Flow Rate Per Day (Point Type 116, parameter #0) must be above the low alarm value (parameter #7) or below the high alarm value (parameter #8) before the associated alarm clears.
14	RESERVED								Reserved for future use
15	RESERVED								Reserved for future use
16	Densitometer Option	R/W CNDL	User	UINT8	1	$0 \rightarrow 1$	0	1.13	Sets whether the meter has a densitometer. Valid values are: 0 = No densitometer, base density from station. 1 = Densitometer present, calculate base density.
17	Density Logical	R/W CNDL	User	UINT8	1	$0 \rightarrow 3$	0	1.13	Sets the logical number of the densitometer point to read the value of the observed density.
18	Observed Density	R/O	System	Float	4	>0.0→Any positive valid IEEE 754 float	737	1.13	Shows the actual measured density of a fluid. Units defined by Density Units option (70,0,3).

Point Type 73: Liquid Meter

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
19	Base Density	R/O	System	Float	4	>0.0→Any positive valid IEEE 754 float	737	1.13	Shows the density of a fluid at base or reference conditions. The system determines this value either by using the station base density or calculating from the observed density, depending on the selected Density Option (73,0,16).
20	Uncorrected Flow Rate / Mass Flow Rate Input	R/W CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 105,5→148,0→27 and TLP 103,5→148,21 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20 and TLP 141,0,6→TLP 141,0,20 (Freq or Raw Pulses)	0,0,0	1.13	Sets the method used to get the pulses from the turbine and the Uncorrected Flow Rate (parameter #14).
21	Pressure Input	R/W CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20	0,0,0	1.13	Sets the method used to get the SP (parameter #16).
22	Temperature Input	R/W CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20 and TLP 106,5→148,22 and TLP 107,5→148, 9	0,0,0	1.13	Sets the method used to get the TMP (parameter #18).

Point Type 73: Liquid Meter

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
23	BSW Input	R/W CNDL	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20	0,0,0	1.13	Sets the method used to get the percent of base sediment and water (BSW).
24	SP (Static Pressure, P_f)	R/O	Both	Float	4	Any valid IEEE 754 float	0.0	1.13	Sets the static pressure value. Units defined by pressure units option (70,0,1).
25	TMP (Temperature, T_f)	R/O	Both	Float	4	Any valid IEEE 754 float	0.0	1.13	Sets the meter temperature value. Units are defined by temperature units option (70,0,2).
26	Percent BSW	R/W CNDL	Both	Float	4	0.0 → Any positive valid IEEE 754 float	0.0	1.13	Sets the percentage by volume of base sediment and water (BSW) in the fluid.
27	Indicated Flow Rate	R/O	System	Double	8	0.0→Any positive valid IEEE 754 float	0.0	1.13	Shows the actual volume or mass flow rate as indicated by the meter. Units are defined by volume or units option (70,0,6) and flow rate option (70,0,9). Volume or mass depends on TLP 73,0,3.
28	Indicated Total	R/O	System	Double	8	Any valid IEEE double precision float	0.0	1.13	Shows the volume or mass total in units selected. Units are defined by volume or mass units option (70,0,6 or 70,0,7). Volume or mass depends on TLP 78,0,3.
29	Gross Volume Flow Rate	R/O	System	Double	8	0.0→Any positive valid IEEE 754 float	0.0	1.13	Shows the indicated volume flow rate corrected for meter factor. Units are defined by volume units option (70,0,6) and flow rate option (70,0,9).
30	Gross Volume Total	R/O	System	Double	8	Any valid IEEE double precision float	0.0	1.13	Shows the gross volumetric total in the selected volume units, defined by Volume Units option (70,0,6).
31	Gross Standard Volume Flow Rate	R/O	System	Double	8	0.0→Any positive valid IEEE 754 float	0.0	1.13	Shows the volume flowrate at base conditions, also corrected for meter performance. Units are defined by volume units option (70,0,6) and flow rate option (70,0,9).

Point Type 73: Liquid Meter

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
32	Gross Standard Volume Total	R/O	System	Double	8	Any valid IEEE double precision float	0.0	1.13	Shows the ongoing accumulation of volume at base conditions, corrected for meter performance. Units are defined by volume units option (70,0,6).
33	Net Standard Volume Flow Rate	R/O	System	Double	8	Any valid IEEE 754 float	0.0	1.13	Shows the gross standard volume flow rate corrected for non-merchantable quantities such as sediment and water. Applies only to crude oil applications. This parameter is identical to Gross Standard Volume Flow Rate (parameter #56) for other fluid types. Units are defined by volume units option (70,0,6) and flow rate option (70,0,9).
34	Net Standard Volume Total	R/O	System	Double	8	0.0→Any positive valid IEEE 754 float	0.0	1.13	Shows the gross standard volume total corrected for non-merchantable quantities such as sediment and water. Applies only to crude oil applications. This parameter is identical to Gross Standard Volume Total (parameter #57) for other fluid types. Units are defined by volume units option (70,0,6).
35	Mass Flow Rate	R/O	System	Double	8	0.0→Any positive valid IEEE 754 float	0.0	1.13	Shows the mass flowrate. Units are defined by mass units option (70,0,7) and flow rate option (70,0,9).
36	Mass Total	R/O	System	Double	8	0.0→Any positive valid IEEE 754 float	0.0	1.13	Shows total accumulation of mass. Units defined by mass units option (70,0,7).
37	Correction for Temperature of the Liquid (CTL)	R/O	Both	Float	4	>0.0 → any valid IEEE 754 float	1.0	1.13	Shows the correction for the effect of temperature on liquid at normal operating conditions.
38	Correction for Pressure of the Liquid (CPL)	R/O	Both	Float	4	>0.0 → any valid IEEE 754 float	1.0	1.13	Shows the correction for compressibility of liquid at normal operating conditions.
39	Combined Correction Factor (CCF)	R/O	Both	Float	4	>0.0 → any valid IEEE 754 float	1.0	1.13	Shows the combined compressibility factor, calculated as CTL x CPL x Meter Factor

Point Type 73: Liquid Meter

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
40	Compressibility Factor (F)	R/O	System	Float	4	>0.0 → any valid IEEE 754 float	0.53	1.13	Show the compressibility factor of liquid in meter at normal operating conditions.
41	Alpha	R/O	System	Float	4	>0.0 → any valid IEEE 754 float	0.000583	1.13	Shows the liquid’s Alpha value.
42	Meter Factor/K-factor Option	R/W	User	UINT8	1				Reserved for future use
43	Meter Factor/K-factor 1	R/W	User	Float	4				Reserved for future use
44	RESERVED	R/W	User	Float	4				Reserved for future use
45	RESERVED	R/W	User	Float	4				Reserved for future use
46	RESERVED	R/W	User	Float	4				Reserved for future use
47	RESERVED	R/W	User	Float	4				Reserved for future use
48	RESERVED	R/W	User	Float	4				Reserved for future use
49	RESERVED	R/W	User	Float	4				Reserved for future use
50	RESERVED	R/W	User	Float	4				Reserved for future use
51	RESERVED	R/W	User	Float	4				Reserved for future use
52	RESERVED	R/W	User	Float	4				Reserved for future use
53	RESERVED	R/W	User	Float	4				Reserved for future use
54	RESERVED	R/W	User	Float	4				Reserved for future use
55	RESERVED	R/W	User	Float	4				Reserved for future use
56	RESERVED	R/W	User	Float	4				Reserved for future use
57	RESERVED	R/W	User	Float	4				Reserved for future use
58	RESERVED	R/W	User	Float	4				Reserved for future use
59	RESERVED	R/W	User	Float	4				Reserved for future use
60	RESERVED	R/W	User	Float	4				Reserved for future use
61	RESERVED	R/W	User	Float	4				Reserved for future use
62	RESERVED	R/W	User	Float	4				Reserved for future use
63	RESERVED	R/W	User	Float	4				Reserved for future use
64	RESERVED	R/W	User	Float	4				Reserved for future use
65	RESERVED	R/W	User	Float	4				Reserved for future use
66	RESERVED	R/W	User	Float	4				Reserved for future use

Point Type 73: Liquid Meter

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
67	BSW Volume Rate	R/O	System	Double	8	0.0 → any valid IEEE 754 float	0.0	1.13	Shows the volume flow rate of non-merchantable quantities such as sediment and water. Applies only to crude oil applications. Units are defined by volume units option (70,0,6) and flow rate option (70,0,9).
68	BSW Volume Total	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the volume total of non-merchantable quantities such as sediment and water. Applies only to Crude Oil applications. Units are defined by volume units option (point type 70, parameter #6) and flow rate option (point type 70, parameter #9).
69	Indicated Volume Today	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the volumetric total for the current contract day in volume units selected. Units are defined by volume units option (point type 70, parameter #6).
70	Gross Volume Today	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of volume at flowing conditions, corrected for meter factor, for the current contract day in volume units selected. Units are defined by volume units option (point type 70, parameter #6).
71	Gross Standard Volume Today	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of volume at base conditions, corrected for meter performance, for the current contract day. Units are defined by volume units option (point type 70, parameter #6).
72	Net Standard Volume Today	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	The accumulation of volume at base conditions, corrected for meter performance and BSW, for the current contract day. Units are defined by volume units option (point type 70, parameter #6).

Point Type 73: Liquid Meter

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
73	BSW Volume Today	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of volume of non-merchantable quantities such as sediment and water for the current contract day. Units are defined by volume units option (point type 70, parameter #6).
74	Mass Today	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of mass for the current contract day. Units are defined by mass units option (point type 70, parameter #7).
75	Indicated Volume Yesterday	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the volumetric total for the previous contract day in volume units selected. Units are defined by volume units option (point type 70, parameter #6).
76	Gross Volume Yesterday	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of volume at flowing conditions, corrected for meter factor, for the previous contract day in volume units selected. Units are defined by volume units option (point type 70, parameter #6).
77	Gross Standard Volume Yesterday	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	The accumulation of volume at base conditions, corrected for meter performance, for the previous contract day. Units are defined by volume units option (point type 70, parameter #6).
78	Net Standard Volume Yesterday	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of volume at base conditions, corrected for meter performance and BSW, for the previous contract day. Units are defined by volume units option (point type 70, parameter #6).
79	BSW Volume Yesterday	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of volume of non-merchantable quantities such as sediment and water for the previous contract day. Units are defined by volume units option (point type 70, parameter #6).

Point Type 73: Liquid Meter

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
80	Mass Yesterday	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of mass for the previous contract day. Units are defined by mass units option (point type 70, parameter #7).
81	Indicated Volume This Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the volumetric total for the current month in volume units selected. Units are defined by volume units option (point type 70, parameter #6).
82	Gross Volume This Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of volume at flowing conditions, corrected for meter factor, for the current month in volume units selected. Units are defined by volume units option (point type 70, parameter #6).
83	Gross Standard Volume This Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of volume at base conditions, corrected for meter performance, for the current month. Units are defined by volume units option (point type 70, parameter #6).
84	Net Standard Volume This Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of volume at base conditions, corrected for meter performance and BSW, for the current month. Units are defined by volume units option (point type 70, parameter #6).
85	BSW Volume This Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of volume of non-merchantable quantities such as sediment and water for the current month. Units are defined by volume units option (point type 70, parameter #6).
86	Mass This Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of mass for the current month. Units are defined by mass units option (point type 70, parameter #7).
87	Indicated Volume Previous Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicated volumetric total for the current contract day in volume units selected. Units are defined by volume units option (point type 70, parameter #6).

Point Type 73: Liquid Meter

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
88	Gross Volume Previous Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of volume at flowing conditions, corrected for meter factor, for the current contract day in volume units selected. Units are defined by volume units option (point type 70, parameter #6).
89	Gross Standard Volume Previous Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of volume at base conditions, also corrected for meter performance, for the current contract day. Units are defined by volume units option (point type 70, parameter #6).
90	Net Standard Volume Previous Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of volume at base conditions, also corrected for meter performance and BSW, for the current contract day. Units are defined by volume units option (point type 70, parameter #6).
91	BSW Volume Previous Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of volume of non-merchantable quantities such as sediment and water for the current contract day. Units are defined by volume units option (point type 70, parameter #6).
92	Mass Previous Month	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0.0	1.13	Indicates the accumulation of mass for the current contract day. Units are defined by mass units option (point type 70, parameter #7).
93	Flow meter Value	R/W	User	Float	4	Any valid IEEE 754 float	0.0	1.13	Specifies the indicated flow rate if the mass option is disabled or the mass flow rate if the mass option is enabled (point type 73, parameter #3).
94	CSW	R/O	System	Float	4	0.0 → any valid IEEE 754 float	0.0	1.13	Indicates the correction factor for sediment and water.
95	CTL Base to ALT	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0	1.13	Indicates the Correction temperature flow.
96	CPL Base to ALT	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0	1.13	Indicates the pressure base conditions to alternate conditions.

Point Type 73: Liquid Meter

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
97	CTPL Base to ALT	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0	1.13	Indicates the temperature base and pressure based conditions to alternate conditions.
98	F Base to ALT	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0	1.13	Indicates the compressibility factor base conditions to alternate conditions.
99	CTL Observed to Base	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0	1.13	Indicates the temperature observed conditions to base conditions.
100	CPL Observed to Base	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0	1.13	Indicates the pressure observed conditions to base conditions.
101	CTPL Observed to Base	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0	1.13	Indicates the temperature and pressure observed conditions to base conditions.
102	F Observed to Base	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0	1.13	Indicates the compressibility factor observed conditions to base conditions.
103	Meter Density Double	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0	1.13	Indicates the meter density at meter conditions.
104	RESERVED								Reserved for future use.
105	Base Density Double	R/O	System	Double	8	0.0 → any valid IEEE double precision float	0	1.13	Indicates the density of a fluid at base or reference conditions. This value is either determined by the station base density or calculated from the observed density, depending on the density option selected (parameter #16)
106	CTPL Rounded	R/O	System	Float	4	0.0 → any valid IEEE double precision float	0	1.13	Indicates the temperature base and pressure base conditions to alternate conditions.
107	Manual Flow Rate	R/W CNDL	User	Float	4	0.0 → any valid IEEE 754 float	0	2.01	Manually sets the flow rate, as opposed to reading the value from a physical device.
108	Manual Pressure Value	R/W CNDL	User	Float	4	0.0 → any valid IEEE 754 float	0	2.01	Manually sets the pressure, as opposed to reading the value from a physical input.
109	Manual Temperature Value	R/W CNDL	User	Float	4	0.0 → any valid IEEE 754 float	0	2.01	Manually sets the temperature, as opposed to reading the value from a physical input.

Point Type 73: Liquid Meter

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
110	Flow Calculation Alarm Option	R/W CNDL	User	UINT8	1	0 → 1	1	2.10	Indicates whether the system should generate flow calculation alarms and send entries to the alarm log. Valid values are 0 (Disabled) and 1 (Enabled).
111	Flow Calculation Alarm Code	R/O	System	BIN	1	0.x00 → 0xFF	0	2.10	See description of individual bits below
111.0	Temperature Out of Bounds		Bit 0				0	2.10	Alarm occurs if the meter/observed temperature is outside of the bounds set by the applicable standard.
111.1	Pressure Out of Bounds		Bit 1				0	2.10	Alarm occurs if the meter/observed pressure is outside of the bounds set by the applicable standard.
111.2	Observed Density Out of Bounds		Bit 2				0	2.10	Alarm occurs if the density is outside of the bounds set by the applicable standard.
111.3	Base Density Out of Bounds		Bit 3				0	2.10	Alarm occurs if the base density is outside of the bounds set by the applicable standard.
111.4	Convergence Error		Bit 4				0	2.10	Alarm occurs if the maximum number of iterations is reached without convergence in the density calculation.
111.5	Refined Product Alarm		Bit 5				0	2.10	Alarm occurs if the base density does not match the base density of the selected product. **Note**: This alarm applies **only** to refined products. .
111.6	Alpha Out of Bounds		Bit 6				0	2.10	Alarm occurs if the entered value of thermal expansion coefficient (alpha) is outside the bounds of the applicable standard. **Note**: This alarm applies **only** to speciality products.
111.7	CTL/CPL Out of Bounds		Bit 7				0	2.10	Alarm occurs if the CTL, CPL, or CTPL exceeds the range of being greater than 0.5 but less than 1.5. Note: This **does not** create an entry in the alarm log.

3.4.14 Point Type 74: Densitometer Interface Parameters

Description: Point type 74 provides parameters to configure a densitometer interface.

Number of Logical Points: 4 densitometer point types depending on the number of active meters.

Storage Location: Point type 74 is saved to internal configuration memory.

Table 3-15: Point Type 74, Densitometer Interface Parameters

Point Type 74: Densitometer Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"Density X" where X is the densito-meter number	1.13	Identification name for specific station. Values must be printable ASCII characters.
1	Density Type	R/W	User	UINT8	1	0 → 5	0	1.13	Sets the type of density input interface: 0 = Solartron Model 7835/45/46/47 1 = Solartron Model 7830/40 2 = UGC 3 = Analog density 4 = Analog Relative Density 5 = Analog API Gravity 6 = Sarasota Densitometer
2	Raw Density Input TLP	R/W	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 105, 5→148,10 or 13 and TLP 96,0→5,2→11and TLP 98,0→31,1→20	0, 0, 0	1.13	Specifies the ROC parameter from which to retrieve the raw density input. The input may either be a frequency from a densitometer or an analog density from any source.
3	Raw Density Input	R/W	Both	FL	4	>0.0 → Any positive valid IEEE 754 float	0.0	1.13	Sets the raw input value. If the density input is a frequency input from a densitometer, this value contains the frequency. Otherwise, it contains the raw density input.

Point Type 74: Densitometer Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
4	Density Input Status	R/O	System	UINT8	1	0 → 1	0	1.13	Indicates the current status of the density input: 0 = Density value within normal range 1 = Density value exceeds density low limit or density high limit for the product.
5	Density Temperature TLP	R/W	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 106, 5→148,22 and TLP 107, 5→148,9and TLP 96,0→5,2→11and TLP 98,0→31,1→20	0, 0, 0	1.13	Specifies the ROC parameter from which to retrieve the temperature at the density measurement.
6	Density Temperature	R/W	Both	FL	4	Any valid IEEE 754 float	60.0	1.13	Sets the value of temperature at the density measurement site. Units defined by temperature units option (point type 70, parameter #2).
7	Density Pressure TLP	R/W	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 96,0→5,2→11and TLP 98,0→31,1→20	0, 0, 0	1.13	Specifies the ROC parameter from which to retrieve the pressure at the densitometer.
8	Density Pressure	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.13	Sets the value of pressure at the density measurement site. Units defined by pressure units option (point type 70, parameter #1).
9	Basic Transducer Constant K0	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant K0 from the calibration certificate of the Solartron or UGC densitometer. The system uses this constant in the general density calculation. Values are in °C and Bar.

Point Type 74: Densitometer Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
10	Basic Transducer Constant K1	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant K1 from the calibration certificate of the Solartron or UGC densitometer. This system uses this constant in the general density calculation. Values are in °C and Bar.
11	Basic Transducer Constant K2	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant K2 from the calibration certificate of the Solartron or UGC densitometer. The system uses this constant in the general density calculation. Values are in °C and Bar.
12	Solartron Temperature Correction Constant K18	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant K18 from the calibration certificate of the Solartron densitometer. The system uses this constant in the temperature compensation calculation. Set to zero to disable the temperature compensation. Values are in °C and Bar.
13	Solartron Temperature Correction Constant K19	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant K19 from the calibration certificate of the Solartron densitometer. This constant is used in the temperature compensation calculation. Set to zero to disable the temperature compensation. Values are in °C and Bar.
14	Solartron Pressure Correction Constant K20A	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant K20A from the calibration certificate of the Solartron densitometer. The system uses this constant in the pressure compensation calculation. Set to zero to disable the pressure compensation. Values are in °C and Bar.
15	Solartron Pressure Correction Constant K20B	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant K20B from the calibration certificate of the Solartron densitometer. This constant is used in the pressure compensation calculation. Set to zero to disable the pressure compensation. Values are in °C and Bar.

Point Type 74: Densitometer Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
16	Solartron Pressure Correction Constant K21A	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant K21A from the calibration certificate of the Solartron densitometer. This constant is used in the pressure compensation calculation. Set to zero to disable the pressure compensation. Values are in °C and Bar.
17	Solartron Pressure Correction Constant K21B	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant K21B from the calibration certificate of the Solartron densitometer. The system uses this constant in the pressure compensation calculation. Set to zero to disable the pressure compensation. Values are in °C and Bar.
18	Velocity of Sound Compensation Option	R/W	User	Double	1	0 → 1	0.0	1.13	Sets the density in kg/m3 compensated for operating temperature other than 20 Deg C.
19	Liquid Velocity of Sound	R/W	User	FL	4	>0.0 → Any positive valid IEEE 754 float	0.0	1.13	Sets the actual velocity of sound of the liquid at flowing conditions in ft/s or m/s.
20	Calibration Velocity of Sound	R/O	System	FL	4	>0.0 → Any positive valid IEEE 754 float	0.0	1.13	Indicates the velocity of sound of the liquid at calibrated conditions in ft/s or m/s.
21	UGC Pressure Correction Constant Pc	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant Pc from the calibration certificate of the UGC densitometer. The system uses this constant in the pressure compensation calculation. Set to zero to disable the pressure compensation.
22	UGC Pressure Correction Constant Kp1	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant Kp1 from the calibration certificate of the UGC densitometer. This constant is used in the pressure compensation calculation. Set to zero to disable the pressure compensation. Values are in °C and Bar.

Point Type 74: Densitometer Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
23	UGC Pressure Correction Constant Kp2	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant Kp2 from the calibration certificate of the UGC densitometer. The system uses this constant in the pressure compensation calculation. Set to zero to disable the pressure compensation. Values are in °C and Bar.
24	UGC Pressure Correction Constant Kp3	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant Kp3 from the calibration certificate of the UGC densitometer. The system uses this constant in the pressure compensation calculation. Set to zero to disable the pressure compensation. Values are in °C and Bar.
25	UGC Temperature Correction Constant Tc	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant Tc from the calibration certificate of the UGC densitometer. This constant is used in the temperature compensation calculation. Set to zero to disable the temperature compensation. Values are in °C and Bar.
26	UGC Temperature Correction Constant Kt1	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant Kt1 from the calibration certificate of the UGC densitometer. The system uses this constant in the temperature compensation calculation. Set to zero to disable the temperature compensation. Values are in °C and Bar.
27	UGC Temperature Correction Constant Kt2	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant Kt2 from the calibration certificate of the UGC densitometer. The system uses this constant in the temperature compensation calculation. Set to zero to disable the temperature compensation. Values are in °C and Bar.

Point Type 74: Densitometer Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
28	UGC Temperature Correction Constant Kt3	R/W	User	Double	8	Any valid IEEE double	0.0	1.13	Sets the constant Kt3 from the calibration certificate of the UGC densitometer. The system uses this constant in the temperature compensation calculation. Set to zero to disable the temperature compensation. Values are in °C and Bar.
29	Density Correction Factor	R/W	User	FL	4	>0.0 → Any positive valid IEEE 754 float	1.0	1.13	Sets the multiplier value to correct densitometer input.
30	Compensated Density	R/O	System	FL	4	Any valid IEEE 754 float	1000.0	1.13	Indicates the density in kg/m3 compensated for operating temperature and pressure other than 20 Deg C. and 1 bar and differences in velocity of sound, if this option is selected (parameter #18).
31	Relative Density	R/O	User	FL	4	>0.0 → Any positive valid IEEE 754 float	1.0	1.13	Indicates the density of fluid relative to the density of water.
32	API Gravity	R/O	User	FL	4	0.0→100.0	9.86	1.13	Indicates the density of fluid expressed as API gravity.
33	Hydrometer Correction Option	R/W	User	UINT8	1	0 → 1	0	1.13	Sets the option to enable hydrometer compensation.
34	Periodic Time	R/O	System	FL	4	>0.0 → Any positive valid IEEE 754 float	0	1.13	Indicates the periodic time of the densitometer input (Solartron).
35	RHO Temp Compensation Option	R/W	User	UINT8	1	0 → 1	0	1.13	Indicates if pressure and temperature compensation of density is enabled.
36	Uncorrected Compensated Density	R/O	System	FL	4	Any valid IEEE 754	0.0	1.13	Indicates the value of the Compensated Density before the user-defined correction factor is applied.
37	Uncorrected Relative Density	R/O	System	FL	4	Any valid IEEE 754	0.0	1.13	Indicates the value of the Relative Density before the user-defined correction factor is applied.
38	Uncorrected API Gravity	R/O	System	FL	4	Any valid IEEE 754	0.0	1.13	Indicates the value of the API Gravity before the user-defined correction factor is applied.

3.4.15 Point Type 75: Meters

Description: Point type 75 defines meter parameters.

Number of Logical Points: 1 logical point for each active meter.

Storage Location: Point type 75 is saved to internal configuration memory.

Table 3-16: Point Type 75, Meter Parametes

Point Type 75: Meter Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Valve to be Controlled	R/O	User	UINT8	1	1 → 4	1 (Log 1) 2 (Log 2) 3 (Log 3) 4 (Log 4)	1.00	Shows the valve that controls flow through this meter. **Note**: This parameter is read-only so it cannot be changed. The value of this parameter always equals its logical number + 1. This ensures a one-to-one correspondence between logicals of meter and valve point types, so that value #1 is assigned to meter #1.
1	Meter ID	R/W	User	String7	7	ASCII String	"Meter #X"	1.00	Sets an identifying name for specific meter for display and logging purposes. Values must be printable ASCII characters.
2	Minimum Flow Rate	R/W_ CNDL	User	UINT32	4	0 → 99999	100	1.00	Sets the minimum flowrate permitted for the time period set in Low Flow Time (63,0,38) before the system raises a Low Flow alarm. Each meter can have different minimum flowrate. DL8000 uses the indicated flowrate from liquid turbine to raise the Low Flow alarm.
3	Maximum Flow Rate	R/W_ CNDL	User	UINT32	4	0 → 99999	660	1.00	Sets the maximum flowrate permitted for the time period set in High Flow Time (63,0,40) before the system raises a High Flow alarm. The DL8000 uses the indicated flowrate from liquid turbine for raising the High Flow alarm.

Point Type 75: Meter Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
4	RESERVED								Reserved for future use
5	Meter Gross Volume (Unauthorized)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the gross volume that passed through the meter when meter was in un-authorized state (i.e. bit for this meter was **0** in 'Meter Authorization status') since unit is initialized. The value never resets; it rolls over when it crosses roll over limit.
6	RESERVED								Reserved for future use
7	Meter Net Std Volume (Unauthorized)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the net standard volume that passed through the meter when meter was in un-authorized state (i.e. bit for this meter was **0** in Meter Authorization status) since unit is initialized. The value never resets; it rolls over when it crosses roll over limit.
8	Meter Mass (Unauthorized)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the mass that passed through the meter when meter was in un-authorized state (i.e. bit for this meter was **0** in Meter Authorization status) since unit is initialized. The value never resets; it rolls over when it crosses roll over limit.
9	RESERVED								Reserved for future use
10	Meter Gross Volume (Batch)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the gross volume delivered from this meter in current batch when meter was in authorized state (i.e. bit for this meter is **1** in Meter Authorization Status). Value resets when new batch is authorized.
11	RESERVED								Reserved for future use
12	Meter Net Std Volume (Batch)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the net standard. volume delivered from this meter in current batch when meter was in authorized state (i.e. bit for this meter is 1 in Meter Authorization status). Value resets when new batch is authorized.

Point Type 75: Meter Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
13	Meter Mass (Batch)	R/O	System	Double	17	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the mass delivered from this meter in current batch when meter was in authorized state (i.e. bit for this meter is 1 in Meter Authorization status). Value resets when new batch is authorized.
14	RESERVED								Reserved for future use
15	Meter Gross Volume (authorized)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	shows the gross volume that passed through the meter when meter was in authorized state (i.e. bit for this meter is 1 in Meter Authorization status) since unit is initialized. The value never resets; it rolls over when it crosses roll over limit.
16	RESERVED								Reserved for future use
17	Meter Net Std Volume (authorized)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the net standard volume that passed through the meter when meter was in authorized state (i.e. bit for this meter is 1 in Meter Authorization status) since unit is initialized. The value never resets; it rolls over when it crosses roll over limit.
18	Meter Mass (authorized)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Indicates the mass passed through the meter when meter was in authorized state (i.e. bit for this meter was 1 in Meter Authorization status) since unit is initialized. The value never resets; it rolls over when it crosses roll over limit.
19	RESERVED								Reserved for future use
20	RESERVED								Reserved for future use
21	RESERVED								Reserved for future use
22	RESERVED								Reserved for future use
23	RESERVED								Reserved for future use
24	RESERVED								Reserved for future use
25	RESERVED								Reserved for future use
26	RESERVED								Reserved for future use
27	RESERVED								Reserved for future use
28	RESERVED								Reserved for future use

Point Type 75: Meter Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
29	RESERVED								Reserved for future use
30	RESERVED								Reserved for future use
31	Temperature Probe 1 TLP	R/W	System	TLP	3	Any valid TLP	0,0,0	1.00	Sets the TLP of the first temperature probe input from which temperature of the meter is read. It should point to TLP of float data type. The system uses this to scan for temperature drift alarm. This alarm is scanned only if **both** Temperature Probe 1 TLP and Temperature Probe 2 TLP (75,0,32) of this meter point to parameter of float data type.
32	Temperature Probe 2 TLP	R/W	System	TLP	3	Any valid TLP	0,0,0	1.00	Sets the TLP of the second temperature probe input from which temperature of the meter is read. It should point to TLP of float data type. The system uses this to scan for temperature drift alarm. This alarm is scanned only if **both** Temperature Probe 1 TLP (75,0,31) and Temperature Probe 2 TLP of this meter point to parameter of float data type.
33	RESERVED								Reserved for future use
34	Transaction Start Gross Reading	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the gross volume meter totalizer (73,0,30) reading when current transaction starts (that is, the first batch in the transaction starts).
35	Transaction Start Net Std Reading	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the net standard volume meter totalizer (73,0,34) reading when current transaction starts (that is, the first batch in the transaction starts).
36	Transaction Start Mass Reading	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the mass meter totalizer (73,0,36) reading when current transaction starts (that is, when the first batch in the transaction starts).
37	Transaction End Gross Reading	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the gross volume meter totalizer (73,0,30) reading when current transaction ends.

Point Type 75: Meter Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
38	Transaction End Net Reading	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the net standard. volume meter totalizer (73,0,34) reading when current transaction ends.
39	Transaction End Mass Reading	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Show the of mass meter totalizer (73,0,36) reading when current transaction ends.
40	Batch Start Gross Reading	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the gross volume meter totalizer (73,0,30) reading when current batch starts.
41	Batch Start Net Std Reading	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the net standard. volume meter totalizer (73,0,34) reading when current batch starts.
42	Batch Start Mass Reading	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the of mass meter totalizer (73,0,36) reading when current batch starts.
43	Batch End Gross Reading	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the gross volume meter totalizer (73,0,30) reading when current batch ends.
44	Batch End Net Std Reading	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the net standard volume meter totalizer (73,0,34) reading when current batch ends.
45	Batch End Mass Reading	R/O	System	Double	8	0.0 to any positive valid IEEE 754 Double	0	1.00	Shows the mass meter totalizer (73,0,36) reading when current batch ends.
46	Stream Target Flow Rate	R/O	System	FL	4	0.0 to any positive valid IEEE 754 float	0	1.00	Shows the current target flowrate for the stream flowing through this meter. The Batching user program sets this value for the inline batch, when each stream is measured by a different meter. **Note**: This target flowrate is always of indicated flowrate type (and same is set as target for PID in case of digital valve).

Point Type 75: Meter Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
47	Stream Flowrate Error Limit	R/O	System	FL	4	0.0 to any positive valid IEEE 754 float	0	1.00	Shows the current target flowrate error-limit for the stream flowing through this meter. The Batching user program sets this value for the inline batch, when each stream is measured by different meter. **Note**: This tolerance band flowrate is always of indicated flowrate type (and same as set in PID in case of digital valve). It allows the tolerance band for alarm checking.
48	Meter Unauthorized Gross Volume (Batch)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	1.00	Shows the gross volume delivered from this meter in current batch when meter was in un-authorized state (i.e. bit for this meter is 0 in Meter Authorization status (63,0,133). The value resets when new batch is authorized.
49	Meter Unauthorized Net Volume (Batch)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	1.00	Shows the net standard volume delivered from this meter in current batch when meter was in un-authorized state (i.e. bit for this meter is 0 in Meter Authorization status (63,0,133). Value resets when new batch is authorized.
50	Meter Unauthorized Mass Volume (Batch)	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	1.00	Shows the mass delivered from this meter in current batch when meter was in un-authorized state (i.e. bit for this meter is 0 in Meter Authorization status (63,0,133). Value resets when new batch gets authorized.
51	Batch Start Indicated Reading	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	1.00	Shows the indicated volume meter totalizer (73,0,28) reading when current batch starts.
52	Batch End Indicated Reading	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	1.00	Indicates the stamp of indicated volume meter totalizer (73,0,28) reading when current batch ends.

Point Type 75: Meter Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
53	Meter Flow Direction	R/W	User	UINT8	1	0 → 1	0	2.00	Defines if the non-system meter is selected for reverse flow (used for vapor return flow in some cases like LPG loading). Valid values are: 0 = Not used for reverse flow 1 = Meter is used to record reverse flow. **Note**: If meter is selected for reverse flow then this TLP should not be one out of meters configured [63,0,20] in system.
54	Reverse Meter Gross Total	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	2.00	Shows the gross volume total that passed through the meter (73,x,30) if you configure meter flow direction (75,x,53Z) for reverse flow. This value resets at batch authorization and at power ON.
55	Reverse Meter Net-Std Total	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	2.00	Shows the net standard volume total that passed through the meter (73,x,34) if you configure meter flow direction for reverse flow (75,x,53). This value resets at batch authorization and at power ON.
56	Reverse Meter Mass Total	R/O	System	Double	8	0.0 to any positive valid IEEE 754 double	0	2.00	Shows the mass total that passed through the meter (73,x,36) if you configure the meter flow direction for reverse flow (75,x,53). This value resets at batch authorization and at power ON.
57	Bad Pulse Count	R/O	System	UINT32	4	0 → 65535	0	2.00	Shows the number of bad pulses received. Refer parameter bad pulse count reset option (64,0,38) for resetting of bad pulse count.
58	Reverse Meter Factor/K-factor Optoin	R/W-CNDL	User	UINT8	1	0 → 1	0	2.30	Indicates how the meter factor and K-factor should interact for a reverse meter. Valid values are **0** (single meter factor and single K-factor) and **1** (meter factor curve with a single K-factor)

Point Type 75: Meter Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
59	Reverse Meter Factor/K-factor 1	R/W-CNDL	User	FL	4	0.8 → 1.2 (for value 0 in parameter 58) or Any positive non-zero valid IEEE 754 float (for value 1 in parameter 58)	1	2.30	Meter factor for the associated flow rate (parameter 60) or K-factor for the associated frequency (parameter 60)
60	Reverse Flowrate/Frequency 1	R/W-CNDL	User	FL	4	0 → 999999.0	0.0	2.30	Flow rate for the associated meter factor. **Note**: This flow rate is always of the indicated type.
61	Reverse Meter Factor/K-factor 2	R/W-CNDL	User	FL	4	0.8 → 1.2 (for value 0 in parameter 58) or Any positive non-zero valid IEEE 754 float (for value 1 in parameter 58)	1	2.30	Meter factor for the associated flow rate (parameter 60) or K-factor for the associated frequency (parameter 60)
62	Reverse Flowrate/Frequency 2	R/W-CNDL	User	FL	4	0 → 999999.0	0.0	2.30	Flow rate for the associated meter factor. **Note**: This flow rate is always of the indicated type.
63	Reverse Meter Factor/K-factor 3	R/W-CNDL	User	FL	4	0.8 → 1.2 (for value 0 in parameter 58) or Any positive non-zero valid IEEE 754 float (for value 1 in parameter 58)	1	2.30	Meter factor for the associated flow rate (parameter 60) or K-factor for the associated frequency (parameter 60)
64	Reverse Flowrate/Frequency 3	R/W-CNDL	User	FL	4	0 → 999999.0	0.0	2.30	Flow rate for the associated meter factor. **Note**: This flow rate is always of the indicated type.
65	Reverse Meter Factor/K-factor 4	R/W-CNDL	User	FL	4	0.8 → 1.2 (for value 0 in parameter 58) or Any positive non-zero valid IEEE 754 float (for value 1 in parameter 58)	1	2.30	Meter factor for the associated flow rate (parameter 60) or K-factor for the associated frequency (parameter 60)

Point Type 75: Meter Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
66	Reverse Flowrate/Frequency 4	R/W-CNDL	User	FL	4	0 → 999999.0	0.0	2.30	Flow rate for the associated meter factor. **Note**: This flow rate is always of the indicated type.
67	Reverse Meter Factor/K-factor 5	R/W-CNDL	User	FL	4	0.8 → 1.2 (for value 0 in parameter 58) or Any positive non-zero valid IEEE 754 float (for value 1 in parameter 58)	1	2.30	Meter factor for the associated flow rate (parameter 60) or K-factor for the associated frequency (parameter 60)
68	Reverse Flowrate/Frequency 5	R/W-CNDL	User	FL	4	0 → 999999.0	0.0	2.30	Flow rate for the associated meter factor. **Note**: This flow rate is always of the indicated type.
69	Reverse Meter Factor/K-factor 6	R/W-CNDL	User	FL	4	0.8 → 1.2 (for value 0 in parameter 58) or Any positive non-zero valid IEEE 754 float (for value 1 in parameter 58)	1	2.30	Meter factor for the associated flow rate (parameter 60) or K-factor for the associated frequency (parameter 60)
70	Reverse Flowrate/Frequency 6	R/W-CNDL	User	FL	4	0 → 999999.0	0.0	2.30	Flow rate for the associated meter factor. **Note**: This flow rate is always of the indicated type.
71	Reverse Meter Factor/K-factor 7	R/W-CNDL	User	FL	4	0.8 → 1.2 (for value 0 in parameter 58) or Any positive non-zero valid IEEE 754 float (for value 1 in parameter 58)	1	2.30	Meter factor for the associated flow rate (parameter 60) or K-factor for the associated frequency (parameter 60)
72	Reverse Flowrate/Frequency 7	R/W-CNDL	User	FL	4	0 → 999999.0	0.0	2.30	Flow rate for the associated meter factor. **Note**: This flow rate is always of the indicated type.

Point Type 75: Meter Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
73	Reverse Meter Factor/K-factor 8	R/W-CNDL	User	FL	4	0.8 → 1.2 (for value 0 in parameter 58) or Any positive non-zero valid IEEE 754 float (for value 1 in parameter 58)	1	2.30	Meter factor for the associated flow rate (parameter 60) or K-factor for the associated frequency (parameter 60)
74	Reverse Flowrate/Frequency 8	R/W-CNDL	User	FL	4	0 → 999999.0	0.0	2.30	Flow rate for the associated meter factor. **Note**: This flow rate is always of the indicated type.
75	Reverse Meter Factor/K-factor 9	R/W-CNDL	User	FL	4	0.8 → 1.2 (for value 0 in parameter 58) or Any positive non-zero valid IEEE 754 float (for value 1 in parameter 58)	1	2.30	Meter factor for the associated flow rate (parameter 60) or K-factor for the associated frequency (parameter 60)
76	Reverse Flowrate/Frequency 9	R/W-CNDL	User	FL	4	0 → 999999.0	0.0	2.30	Flow rate for the associated meter factor. **Note**: This flow rate is always of the indicated type.
77	Reverse Meter Factor/K-factor 10	R/W-CNDL	User	FL	4	0.8 → 1.2 (for value 0 in parameter 58) or Any positive non-zero valid IEEE 754 float (for value 1 in parameter 58)	1	2.30	Meter factor for the associated flow rate (parameter 60) or K-factor for the associated frequency (parameter 60)
78	Reverse Flowrate/Frequency 10	R/W-CNDL	User	FL	4	0 → 999999.0	0.0	2.30	Flow rate for the associated meter factor. **Note**: This flow rate is always of the indicated type.
79	Reverse Meter Factor/K-factor 11	R/W-CNDL	User	FL	4	0.8 → 1.2 (for value 0 in parameter 58) or Any positive non-zero valid IEEE 754 float (for value 1 in parameter 58)	1	2.30	Meter factor for the associated flow rate (parameter 60) or K-factor for the associated frequency (parameter 60)

Point Type 75: Meter Parameters

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
80	Reverse Flowrate/Frequency 11	R/W-CNDL	User	FL	4	0 → 999999.0	0.0	2.30	Flow rate for the associated meter factor. **Note**: This flow rate is always of the indicated type.
81	Reverse Meter Factor/K-factor 12	R/W-CNDL	User	FL	4	0.8 → 1.2 (for value 0 in parameter 58) or Any positive non-zero valid IEEE 754 float (for value 1 in parameter 58)	1	2.30	Meter factor for the associated flow rate (parameter 60) or K-factor for the associated frequency (parameter 60)
82	Reverse Flowrate/Frequency 12	R/W-CNDL	User	FL	4	0 → 999999.0	0.0	2.30	Flow rate for the associated meter factor. **Note**: This flow rate is always of the indicated type.
83	Reverse K-factor	R/W-CNDL	User	FL	4	Any positive non-zero valid IEEE 754 float	0.0	2.30	Value determined by dividing the quantity of fluid measured by the proving system by the quanity indicated by the meter during the prove (for reverse meter).
84	Reverse Meter Factor	R/W-CNDL	User	FL	4	0.8 → 1.2	0.0	2.30	Indicates the linear meter constance (K-factor) expressed in pulses/ft3 or pulses/m3, depending on the volume and mass units option in the Liquid Preference point type (70).
85	Solenoid 1	R/W	User	TLP	3	Any valid TLP	0,0,0	2.30	Defines the output status contact TLP for solenoid 1. **Note**: This is for **either** single-acting or double-acting valves.
86	Solenoid 2	R/W	User	TLP	3	Any valid TLP	0,0,0	2.30	Defines the output status contact TLP for solenoid 1. **Note**: This is **only** for double-acting valves.
87	DO 1 Retention Time(s)	R/W	User	UINT8	1	0 → 30	30	2.30	Indicates the time, in seconds, for which solenoid 1 remains ON after energizing.
88	DO 2 Retention Time(s)	R/W	User	UINT8	1	0 → 30	30	2.30	Indicates the time, in seconds, for which solenoid 2 remains ON after energizing.

3.4.16 Point Type 76: Valves

Description: Point type 76 defines valve parameters.

Number of Logical Points: 1 logical point for each active valve.

Storage Location: Point type 76 is saved to internal configuration memory.

Table 3-17: Point Type 76, Valves

Point Type 76: Valves

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	RESERVED								Reserved for future use
1	Low Flow Percentage Error	R/W_CNDL	User	UINT8	1	2 → 10	5	1.00	Sets the percentage of difference in the actual low flow rate and the programmed low flow rate (setpoint) allowed before the system sends a flow rate adjustment command to the flow control valve. This parameter defines the deadband and is only in effect when the low flow rate is established and not in effect when the flow rate is changing to the low flow rate during startup or shutdown. The suggested value is 5 percent. Higher values may affect measurement accuracy since the flow rate will be allowed to vary over a wider range without being controlled.

Point Type 76: Valves

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
2	High Flow Percentage Error	R/W_CNDL	User	UINT8	1	2 → 10	2	1.00	Sets the percentage of difference in the actual high flow rate and the programmed high flow rate (setpoint) allowed before a flow rate adjustment command is sent to the flow control valve. This configuration parameter defines the deadband and is only in effect when the high flow rate setpoint is set. The suggested value is 2 percent. Higher values may affect measurement accuracy since the flow rate will be allowed to vary over a wider range without being controlled.
3	RESERVED								Reserved for future use
4	Solenoid 1 (Upstream)	R/W	User	TLP	3	AC I/O auto-out or DO status	0,0,0	1.00	Defines the output status contact TLP for solenoid 1. It should point to ACIO auto-out (140,x,19) or DO status (102,x,8) point type status parameter having UINT8 data type.
5	Solenoid 2 (Downstream)	R/W	User	TLP	3	AC I/O auto-out or DO status	0,0,0	1.00	Defines the output status contact TLP for solenoid 2. It should point to ACIO auto-out (140,x,19) or DO status (102,x,8) point type status parameter having UINT8 data type.
6	Stem Switch 1 (Upstream)	R/W	User	TLP	3	AC I/O auto-out or DO status	0,0,0	1.00	Defines the output status contact TLP for stem switch 1. It should point to ACIO auto-out (140,x,19) or DO status (102,x,8) point type status parameter having UINT8 data type.
7	Stem Switch 2 (Downstream)	R/W	User	TLP	3	AC I/O auto-out or DO status	0,0,0	1.00	Defines the output status contact TLP for stem switch 2. It should point to ACIO auto-out (140,x,19) or DO status (102,x,8) point type status parameter having UINT8 data type.

3.4.17 Point Type 82: Virtual Discrete Outputs

Description: Point type 82 provides the parameters for setting up virtual discrete outputs.

Number of Logical Points: 24 logical points may exist.

Storage Location: Point type 82 is saved to internal configuration memory.

Table 3-18: Point Type 82, Virtual Discrete Output

Point Type 82: Virtual Discrete Output

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"DO Default"	2.10	Identifies a specif DO. Values must be printable ASCII characters.
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"Percent…"	2.10	Describes the units used by the DO. Values must be printable ASCII characters.
2	Scanning Mode	R/W	User	UINT8	1	0 → 1	1	2.10	Indicates the scanning mode. Value values are: 0 = Disabled (no changes to output occur) 1 = Automatic (anything changes DO values) 2 = Manual (only user can change DO values)
3	Alarming	R/W	User	UINT8	1	0 → 1	0	2.10	If enabled, alarms are generated and set to the Alarm Log. Valid values are **0** (Disabled) and **1** (Enabled).
4	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	2.10	Indicates a SRBX alarm is desired if an alarm condition clears. Valid values are **0** (SRBX on Clear Disabled) and **1** (SRBX on Clear Enabled).
5	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	2.10	Indicates a SRBX alarm is desired if an alarm condition occurs. Valid values are **0** (SRBX on Set Disabled) and **1** (SRBX on Set Enabled).
6	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	2.10	
6.0	Not Used			Bit 0			0	2.10	Not Used

Point Type 82: Virtual Discrete Output

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6.1	Not Used			Bit 1			0	2.10	Not Used
6.2	Not Used			Bit 2			0	2.10	Not Used
6.3	Not Used			Bit 3			0	2.10	Not Used
6.4	Not Used			Bit 4			0	2.10	Not Used
6.5	Not Used			Bit 5			0	2.10	Not Used
6.6	Not Used			Bit 6			0	2.10	Not Used
6.7	Not Used			Bit 7			0	2.10	Not Used
7	Failsafe on Reset	R/W	User	UNIT8	1	0 → 1	0	2.10	If enabled, the Status (parameter #8) is set to the status indicated in 'Failsafe Status Value' (Parameter #22) on a restart of any kind. If disabled, the last Status before the restart will be used. Valid values are 0 (Output Last Status on Reset) and 1 (Use Failsafe value on Reset).
8	Auto Output	R/W	Both	UNIT8	1	0 → 1	0	2.10	Controls the state of the DO when Scanning (parameter #2) is in auto mode. In other words, the physical output gets this status when the mode (parameter # 2) is set to Automatic.
9	Accumulated Value	R/W	Both	UINT32	4	0 → 4,294,967,295	0	2.10	Number of times the Status (parameter #8) goes from OFF to ON
10	Momentary Mode	R/W	User	UNIT8	1	0 → 1	0	2.10	If enabled, the Status (parameter #8) is turned ON for the entered Time On (parameter #14) and then be turned OFF. Valid valules are 0 (Momentary Disabled) and 1 (Momentary Enabled).
11	Momentary Active	R/O	System	UNIT8	1	0 → 1	0	2.10	Indicates that the DO currently has the Momentary ability active. Valid values are 0 (Momentary Not Active) and 1 (Momentary Active).
12	Toggle Mode	R/W	User	UNIT8	1	0 → 1	0	2.10	If enabled, the Status (parameter #8) is ON for the entered Time On

Point Type 82: Virtual Discrete Output

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
									(parameter #14) and then turned OFF for the same Time On. The Status continues to cycle between the ON and OFF states. Vallid values are 0 (Toggle Disabled) and 1 (Toggle Enabled).
13	Timed Discrete Output (TDO) Mode	R/W	User	UNIT8	1	0 → 1	0	2.10	If enabled, the Status (parameter #8) is turned ON for a calculated Time On (parameter #14) based upon the entered EU Value (parameter #20). After the Time On has expired, the Status is turned OFF and remains that way until a new EU Value is entered. Valid values are 0 (TDO Disabled) and 1 (TDO Enabled).
14	Time Out	R/W	Both	FL	4	**DO**: 0.0 → 43,200.0 **DOR**: 43,200.0	1.0	2.10	Number of seconds the Status (parameter #8) is turned on for if in TDO, Toggle, or Momentary Mode.
15	Cycle Time	R/W	User	FL	4	>0.0 → 43,200.0	15.0	2.10	Number of seconds for when TDO Mode (parameter #13) and Toggle Mode (parameter #12) are selected. The Status (parameter #8) is ON for the calculated Time On (parameter #14) based upon the entered EU Value (parameter #20). The Status is then turned OFF based upon the Cycle Time minus the Time On.
16	Low Reading Time	R/W	User	FL	4	0.0 → 43,200.0	3.0	2.10	Minimum number of seconds the calculated Time On (parameter #14) is when the entered EU Value (parameter #20) is less than or equal to the entered Low Reading EU (parameter #18).
17	High Reading Time	R/W	User	FL	4	0.0 → 43,200.0	12.0	2.10	Maximum number of seconds the calculated Time On (parameter #14) will be when the entered EU Value (parameter #20) is greater than or equal to the entered High Reading EU (parameter #19).
18	Low Reading EU	R/W	User	FL	4	Any valid IEEE 754 float	0.0	2.10	Minimum EU Value (parameter #20) possible.
19	High Reading EU	R/W	User	FL	4	Any valid IEEE 754 float	100.0	2.10	Maximum EU Value (parameter #20) possible.

Point Type 82: Virtual Discrete Output

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
20	EU Value	R/W	User	FL	4	Any valid IEEE 754 float	0.0	2.10	Value in Engineering Units
21	Manual Output	R/W	User	UINT8	1	0 → 1	0	2.10	Controls the state of the DO when Scanning (parameter #2) is in manual mode. In other words, the physical output gets this status when the mode (parameter # 2) is set to Automatic.
22	Failsafe Output	R/W	User	UINT8	1	0 → 1	1	2.10	The state the output is placed in when the unit is started and the Failsafe on Reset Parameter (Parameter 7) is set to 1, Use Failsafe value on reset.
23	RESERVED								Reserved for future use
24	Physical Output	R/O	System	UINT8	1	0 → 1	0	2.10	Indicates the current state of the DO. Valid values are 1 (ON) and 0 (OFF).
25	Invert Output Mode	R/W	User	UNIT8	1	0 → 1	0	2.10	Inverts the output of the DO channel, allowing you to use TDO mode to keep a channel OFF for a set amount of time and then bring the channel back ON. Valid values are 0 (Normal) and 1 (Inverted). **Note:** This **always** inverts the output, including the Failsafe Output.
26	DO Type	R/O	System	UINT8	1	0 → 1	0	2.10	Indicates the DO type. Valid values are **0** (DO Relay) or **1** (DO Solid State).

3.4.18 Point Type 84: HART Extended Point Type

Description: Point type 84 provides the HART parameters associated with the HART-2 module.

Number of Logical Points: 4 logicals per installed module may exist.

Storage Location: Any parameter noted as “persistent” is saved to internal configuration memory.

Table 3-19: Point Type 84, HART Extended

Point Type 84: HART Extended

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Channel Alarming	R/W	User	UINT8	1	0-1	0	2.20	If enabled, generates channel alarms and sends them to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled). **Note**: This parameter is **persistent**.
1	Channel Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0	2.20	Alarm value for the HART channel. **Note**: This parameter is **persistent**.
1.0	AI Low Alarm			Bit 0			0		If set, the HART AI EU value is less than or equal to the AI Low Alarm EU (parameter #2). If clear, the HART EU value is greater than the AI Low Alarm EU (parameter #2). Only applies when the channel is configured as an AI.
1.2	AI High Alarm			Bit 2			0		If set, the HART AI EU value is greater than or equal to the AI High Alarm EU (parameter #3). If clear, the HART EU value is less than the AI High Alarm EU (parameter #3). Only applies when the channel is configured as an AI.
1.5	AO Readback Alarm			Bit 5			0		If set, the HART module is not detecting a device on the output line. If clear, the analog output is functioning correctly. Only applies when the channel is configured as an AO.
1.6	Point Fail Alarm			Bit 6			0		If set, communicating with the HART module has failed. If clear, the HART’s hardware is operating properly.

Point Type 84: HART Extended

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
2	AI Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-10.0	2.20	Alarm value for HART AI Low Alarm. **Note**: This parameter is **persistent**.
3	AI High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	110.0	2.20	Alarm value for HART AI High Alarm. **Note**: This parameter is **persistent**.
4	Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	2.20	Provides a range (±) that the HART AI EU Value may move between without causing another alarm. **Note**: This parameter is **persistent**.
5	Device 1 Alarming	R/W	User	UINT8	1	0-1	0	2.20	If enabled, generates device alarms and sends them to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled). **Note**: This parameter is **persistent**.
6	Device 1 Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0	2.20	Alarm code for the device on the HART channel. **Note**: This parameter is **persistent**.
6.0	Device 1 PV Low Alarm			Bit 0			0	2.20	If set, the Device PV value is less than or equal to the Device PV Low Alarm Value. If clear, the Device PV value is greater than the Device PV Low Alarm Value.
6.2	Device 1 PV High Alarm			Bit 2			0	2.20	If set, the Device PV value is greater than or equal to the Device PV High Alarm Value. If clear, the Device PV value is less than the Device PV High Alarm Value.
6.6	Device 1 Point Fail Alarm			Bit 6			0	2.20	If set, communicating with the HART Device has failed. If clear, the HART Device is operating correctly.
7	Device 1 PV Low Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	-10	2.20	Alarm value for Device PV Low Alarm. **Note**: This parameter is **persistent**.
8	Device 1 PV High Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	1,000,000	2.20	Alarm value for Device PV High Alarm. **Note**: This parameter is **persistent**.
9	Device 1 Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	0	2.20	Provides a range (±) that the Device PV Value may move between without causing another alarm. **Note**: This parameter is **persistent**.

Point Type 84: HART Extended

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
10	Device 1 Download PV	R/W	USER	FL	4	Any valid IEEE 754 float	0	2.20	When the device Poll Mode is set to Download PV (4), the PV value of the device is set to the Device Download PV value. **Note**: This parameter is **persistent**.
11	Device 1 Live PV Value	R/O	System	FL	4	Any valid IEEE 754 float	0	2.20	The current value of the PV returned from the card or last live value if scan mode is set to Skip this Device or Slot modes. **Note**: This parameter is **persistent**.
12	Device 1 In Use Mode	R/W_LOG	User	UINT8	1	0-2	0	2.20	Determines what value is used to populate the PV parameter. Valid values are: 0 = live or last live 1 = failsafe value 2 = download value. Overrides failsafe mode except when in live mode. **Note**: This parameter is **persistent**.
13	Device 1 In Use Status	R/O	System	UINT8	1	0-6	0	2.20	Status of what value is being used to populate the PV. Valid values are: 0 = live or last live value without failure 1 = last live/scanning disabled 2 = failed to last live value 3 = failed to download value 4 = failed to failsafe value, 5 = set to download value, 6 = set to failsafe value **Note**: This parameter is **persistent**.
14	Device 2 Alarming	R/W	User	UINT8	1	0-1	0	2.20	If enabled, device alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled). **Note**: This parameter is **persistent**.
15	Device 2 Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0	2.20	Alarm code for the device on the HART channel. **Note**: This parameter is **persistent**.
15.0	Device 2 PV Low Alarm			Bit 0			0	2.20	If set, the Device PV value is less than or equal to the Device PV Low Alarm Value. If clear, the Device PV value is greater than the Device PV Low Alarm Value.

Point Type 84: HART Extended

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
15.2	Device 2 PV High Alarm			Bit 2			0	2.20	If set, the Device PV value is greater than or equal to the Device PV High Alarm Value. If clear, the Device PV value is less than the Device PV High Alarm Value.
15.6	Device 2 Point Fail Alarm			Bit 6			0	2.20	If set, communicating with the HART Device has failed. If clear, the HART Device is operating correctly.
16	Device 2 PV Low Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	-10	2.20	Alarm value for Device PV Low Alarm. **Note**: This parameter is **persistent**.
17	Device 2 PV High Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	1,000,000	2.20	Alarm value for Device PV High Alarm. **Note**: This parameter is **persistent**.
18	Device 2 Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	0	2.20	Provides a range (±) within which the Device PV Value may move between without causing another alarm. **Note**: This parameter is **persistent**.
19	Device 2 Download PV	R/W	USER	FL	4	Any valid IEEE 754 float	0	2.20	When the device Poll Mode is set to Download PV (4), the PV value of the device is set to the Device Download PV value. **Note**: This parameter is **persistent**.
20	Device 2 Live PV Value	R/O	System	FL	4	Any valid IEEE 754 float	0	2.20	The current value of the PV returned from the card or last live value if scan mode is set to Skip this Device or Slot modes. **Note**: This parameter is **persistent**.
21	Device 2 In Use Mode	R/W	User	UINT8	1	0-2	0	2.20	Determines what value populates the PV parameter. Valid values are: 0 = live or last live 1 = failsafe value 2 = download value. Overrides failsafe mode except when in live mode. **Note**: This parameter is **persistent**.

Point Type 84: HART Extended

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
22	Device 2 In Use Status	R/O	System	UINT8	1	0-6	0	2.20	Status of what value is being used to populate the PV. Valid values are: 0 = live or last live value without failure 1 = last live/scanning disabled 2 = failed to last live value 3 = failed to download value, 4 = failed to failsafe value 5 = set to download value 6 = set to failsafe value **Note**: This parameter is **persistent**.
23	Device 3 Alarming	R/W	User	UINT8	1	0-1	0	2.20	If enabled, device alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled). **Note**: This parameter is **persistent**.
24	Device 3 Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0	2.20	Alarm code for the device on the HART channel. **Note**: This parameter is **persistent**.
24.0	Device 3 PV Low Alarm			Bit 0			0	2.20	If set, the Device PV value is less than or equal to the Device PV Low Alarm Value. If clear, the Device PV value is greater than the Device PV Low Alarm Value.
24.2	Device 3 PV High Alarm			Bit 2			0	2.20	If set, the Device PV value is greater than or equal to the Device PV High Alarm Value. If clear, the Device PV value is less than the Device PV High Alarm Value.
24.6	Device 3 Point Fail Alarm			Bit 6			0	2.20	If set, communicating with the HART Device has failed. If clear, the HART Device is operating correctly.
25	Device 3 PV Low Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	-10	2.20	Alarm value for Device PV Low Alarm. **Note**: This parameter is **persistent**.
26	Device 3 PV High Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	1,000,000	2.20	Alarm value for Device PV High Alarm. **Note**: This parameter is **persistent**.
27	Device 3 Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	0	2.20	Provides a range (±) that the Device PV Value may move between without causing another alarm. **Note**: This parameter is **persistent**.

Point Type 84: HART Extended

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
28	Device 3 Download PV	R/W	USER	FL	4	Any valid IEEE 754 float	0	2.20	When the device Poll mode is set to Download PV (4), the PV value of the device is set to the Device Download PV value. **Note**: This parameter is **persistent**.
29	Device 3 Live PV Value	R/O	System	FL	4	Any valid IEEE 754 float	0	2.20	The current value of the PV returned from the card or last live value if Scan mode is set to Skip this Device or Slot modes. **Note**: This parameter is **persistent**.
30	Device 3 In Use Mode	R/W	User	UINT8	1	0-2	0	2.20	Determines what value populates the PV parameter. Valid values are: 0 = live or last live 1 = failsafe value 2 = download value. Overrides failsafe mode except when in live mode. **Note**: This parameter is **persistent**.
31	Device 3 In Use Status	R/O	System	UINT8	1	0-6	0	2.20	Status of what value is being used to populate the PV. Valid values are**:** 0 = live or last live value without failure 1 = last live/scanning disabled 2 = failed to last live value 3 = failed to download value 4 = failed to failsafe value 5 = set to download value 6 = set to failsafe value. **Note**: This parameter is **persistent**.
32	Device 4 Alarming	R/W	User	UINT8	1	0-1	0	2.20	If enabled, device alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled). **Note**: This parameter is **persistent**.
33	Device 4 Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0	2.20	Alarm code for the device on the HART channel. **Note**: This parameter is **persistent**.
33.0	Device 4 PV Low Alarm			Bit 0			0	2.20	If set, the Device PV value is less than or equal to the Device PV Low Alarm Value. If clear, the Device PV value is greater than the Device PV Low Alarm Value.

Point Type 84: HART Extended

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
33.2	Device 4 PV High Alarm			Bit 2			0	2.20	If set, the Device PV value is greater than or equal to the Device PV High Alarm Value. If clear, the Device PV value is less than the Device PV High Alarm Value.
33.6	Device 4 Point Fail Alarm			Bit 6			0	2.20	If set, communicating with the HART Device has failed. If clear, the HART Device is operating correctly.
34	Device 4 PV Low Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	-10	2.20	Alarm value for Device PV Low Alarm. **Note**: This parameter is **persistent**.
35	Device 4 PV High Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	1,000,000	2.20	Alarm value for Device PV High Alarm. **Note**: This parameter is **persistent**.
36	Device 4 Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	0	2.20	Provides a range (±) that the Device PV Value may move between without causing another alarm. **Note**: This parameter is **persistent**.
37	Device 4 Download PV	R/W	USER	FL	4	Any valid IEEE 754 float	0	2.20	When the device Poll Mode is set to Download PV (4), the PV value of the device is set to the Device Download PV value. **Note**: This parameter is **persistent**.
38	Device 4 Live PV Value	R/O	System	FL	4	Any valid IEEE 754 float	0	2.20	The current value of the PV returned from the card or last live value if scan mode is set to Skip this Device or Slot modes. **Note**: This parameter is **persistent**.
39	Device 4 In Use Mode	R/W	User	UINT8	1	0-2	0	2.20	Determines what value populates the PV parameter. Valid values are:: 0 = live or last live 1 = failsafe value 2 = download value. Overrides failsafe mode except when in live mode. **Note**: This parameter is **persistent**.

Point Type 84: HART Extended

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
40	Device 4 In Use Status	R/O	System	UINT8	1	0-6	0	2.20	Status of what value is being used to populate the PV. Valid values are: : 0 = live or last live value without failure 1 = last live/scanning disabled 2 = failed to last live value 3 = failed to download value 4 = failed to failsafe value 5 = set to download value 6 = set to failsafe value **Note**: This parameter is **persistent**.
41	Device 5 Alarming	R/W	User	UINT8	1	0-1	0	2.20	If enabled, device alarms may be generated and sent to the Alarm Log. Valid values are 0 (Disabled) and 1 (Enabled). **Note**: This parameter is **persistent**.
42	Device 5 Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0	2.20	Alarm code for the device on the HART channel. **Note**: This parameter is **persistent**.
42.0	Device 5 PV Low Alarm			Bit 0			0	2.20	If set, the Device PV value is less than or equal to the Device PV Low Alarm Value. If clear, the Device PV value is greater than the Device PV Low Alarm Value.
42.2	Device 5 PV High Alarm			Bit 2			0	2.20	If set, the Device PV value is greater than or equal to the Device PV High Alarm Value. If clear, the Device PV value is less than the Device PV High Alarm Value.
42.6	Device 5 Point Fail Alarm			Bit 6			0	2.20	If set, communicating with the HART device has failed. If clear, the HART device is operating correctly.
43	Device 5 PV Low Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	-10	2.20	Alarm value for Device PV Low Alarm. **Note**: This parameter is **persistent**.
44	Device 5 PV High Alarm Value	R/W	User	FL	4	Any valid IEEE 754 float	1,000,000	2.20	Alarm value for Device PV High Alarm. **Note**: This parameter is **persistent**.
45	Device 5 Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	2.20	Provides a range (±) in which the Device PV Value may move between without causing another alarm. **Note**: This parameter is **persistent**.

Point Type 84: HART Extended

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
46	Device 5 Download PV	R/W	USER	FL	4	Any valid IEEE 754 float	0	2.20	When the device Poll Mode is set to Download PV (4), the PV value of the device is set to the Device Download PV value. **Note**: This parameter is **persistent**.
47	Device 5 Live PV Value	R/O	System	FL	4	Any valid IEEE 754 float	0	2.20	The current value of the PV returned from the card or last live value if scan mode is set to Skip this Device or Slot modes. **Note**: This parameter is **persistent**.
48	Device 5 In Use Mode	R/W	User	UINT8	1	0-2	0	2.20	Determines what value is used to populate the PV parameter. Valid values are: 0 = live or last live 1 = failsafe value 2 = download value. Overrides failsafe mode except when in live mode. **Note**: This parameter is **persistent**.
49	Device 5 In Use Status	R/O	System	UINT8	1	0-6	0	2.20	Status of what value is being used to populate the PV. Valid values are: : 0 = live or last live value without failure 1 = last live/scanning disabled 2 = failed to last live value 3 = failed to download value 4 = failed to failsafe value 5 = set to download value 6 = set to failsafe value **Note**: This parameter is **persistent**.
50	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	“ “	2.20	Describes the units the HART AI uses. Values must be primaryily ASCII characters. **Note**: This parameter is **persistent**.

3.4.19 Point Type 85: HART Parameters

Description: Point type 85 defines HART parameters.

Number of Logical Points: 4 logicals per module inserted may exist.

Storage Location: The parameters listed as persistent are saved to internal configuration memory for point type 85.

Table 3-20: Point Type 85, HART

Point Type 85: HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0 HART	Channel Version	R/O	System	AC	10	0x20 - 0x5F for each byte	""	1.10	Indicates the version number for the firmware in the channel.
0 HART-2	RESERVED								
1 HART	Channel I/O	R/O	System	UINT8	1	0 – 1	0	1.10	Indicates if a channel is an analog input or output. Valid values are: 0 = Input 1 = Output **Note**: This value is **persistent**.
1 HART-2	Channel I/O	R/W	User	UINT8	1	0 – 1	0	2.20	Indicates if a channel is an analog input or output. Valid values are: 0 = Input 1 = Output **Note**: This value is **persistent**.
2 HART	HART Communication Mode	R/W	User	UINT8	1	0-2	1	1.10	If disabled, all HART communication stops and no changes occur unless manually entered. Valid values are: 0 = Disabled 1 = Point to Point 2 = Multidrop **Note**: This value is **persistent**.

Point Type 85: HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
2 HART-2	HART Communication Mode	R/W	User	UINT8	1	Bits 0-6: 0-2 Bit7: 0-1	1	2.20	If disabled, all HART communication stops and no changes occur unless manually entered. Valid values are: Bits 0-6 0 = Disabled 1 = Point to Point 2 = Multidrop Bit7: 0 = Primary Master 1= Secondary Master **Note**: This value is **persistent**.
3	Number of Devices Connected	R/W	User	UINT8	1	1 – 5	1	1.10	Number of devices connected in multidrop mode. **Note**: This value is **persistent**.
4 HART	HART COM Status	R/O	System	UINT8	1	0→3	1	1.10	Indicates the status of the HART com. Valid values are: 0 = Not Scanning 1 = Scanning 2 = Dual Master 3 = Pass thru
4 HART-2	HART COM Status	R/O	System	UINT8	1	0→4	1	2.20	Indicates the status of the HART com. Valid values are: 0 = Not Scanning 1 = Scanning 2 = Dual Master 3 = Pass thru 4 = Device in Burst mode detected
5	Analog Mode	R/W	User	UINT8	1	0→4	1	1.10	Analog Input. Valid values are: 0 = Disabled 1 = Enabled 3 = Calibration – EU Value not longer updates and freezes at this value. 4 = Cancel Calibration (restore previous calibration) Analog Output. Valid values are: 0 = Disabled 1 = Enabled (Auto) 2 = Manual **Note**: This value is **persistent**.

Point Type 85: HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6	ROC Protocol Pass Thru Enable	R/W	User	UINT8	1	0 – 2	1	1.10	Enables ROC protocol pass thru communication. 0 = Disabled, 1 = Enabled 0: Disable 1: Strip all bytes, including preambles, before message 2: Don't alter the message, return all bytes. Note: This is only R/W (to other than 0) if the license is available for this feature. **Note**: This value is **persistent**.
7 HART	ROC Protocol Pass Thru Timeout	R/W	User	UINT32	4	0 - 4,294,967,295	5000	1.10	Timeout in milliseconds to resume polling of HART device after receiving ROC protocol pass thru communication. **Note**: This value is **persistent**.
7 HART-2	Internal Resistor Control	R/W	User	UINT32	4	0 - 4,294,967,295	5000	2.20	Enables or disables internal resistor. Bits 0-30 are used. Valid values but bit 31 are: 0 = Enabled 1 = Disabled **Note**: This value is **persistent**.
8	EU Value	R/O	Both	FL	4	Any valid IEEE 754 float	0	1.10	EU value of analog input or output **Note**: This value is persistent.
9	Failsafe on Reset	R/W	User	UINT8	1	0→1	0	1.10	0 = Use last EU Value on reset 1 = Use Failsafe value on Reset If enabled (1), the raw D/A Output will be set to the Failsafe value on a restart of any kind. If disabled, the last EU Value or the last saved EU Value will be used to determine the Raw D/A Output after a restart. **Note**: This value is **persistent**.
10	Failsafe Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Output value when the unit starts and the Failsafe on Reset Parameter is set to 1, Use Failsafe value on reset. **Note**: This value is **persistent**.
11	Manual Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	The EU value used as an output when Scanning is in manual mode. **Note**: This value is **persistent**.

Point Type 85: HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	Auto Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	The EU value used as an output when Scanning is in auto mode. **Note**: This value is **persistent**.
13	Physical Value	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.10	Indicates the current value of the output in Engineering Units.
14	Physical Raw D/A Output	R/O	System	UINT16	2	0 → 65,535	AI:0 AO: 5,257	1.10	Calculated Digital-to-Analog value based upon The EU value that is currently being outputed EU Value.
15	Cabribration Live value	R/O	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Live value when calibrating an AI. **Note**: This value is **persistent**.
16	EU Calibration Value Zero	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Zero EU calibration value. This parameter is read/write when the HART channel is configured as an AO or when in calibration mode if configured as an AI. **Note**: This value is **persistent**.
17	EU Calibration Value Span	R/W	User	FL	4	Any valid IEEE 754 float	100.0	1.10	Span EU calibration value. This parameter is read/write when the HART channel is configured as an AO or when in calibration mode if configured as an AI. **Note**: This value is **persistent**.
18	EU Raw Value	R/O	System	UINT16	2	0 - 65535	0	1.10	Raw EU value of analog input or output **Note**: This value is **persistent**.
19	EU Raw Calibration Zero	R/O	System	UINT16	2	0 - 65535	AI: 621 AO: 5,257	1.10	Zero raw EU calibration value. **Note**: This value is **persistent**.
20	EU Raw Calibration Span	R/O	System	UINT16	2	0 - 65535	AI:3,103 AO: 21,030	1.10	Span raw EU calibration value. **Note**: This value is **persistent**.
21 HART	Device 1 Poll Mode	R/W	User	UINT8	1	0-5	0	1.10	Indicates the polling mode for device 1. Valid values are: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables 4 = Full Update **Note**: This value is **persistent**.

Point Type 85: HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
21 HART-2	Device 1 Poll Mode	R/W	User	UINT8	1	Bit 7: 0-1 Bits 0-6: 0-3	0	2.20	Indicates the polling mode for device 1. Valid values are: Bit 7 (Update State): 0 = No update 1 = Update Bits0-6: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables **Note**: This value is **persistent**.
22	Device 1 Polling Address	R/O	Both	UINT8	1	0-15	0	1.10	Polling address for device 1.
23	Device 1 Status	R/O	System	UINT8	1	0-1	0	1.10	0: No Device Found 1: Communicating
24	Device 1 Actual Scan Period	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Period at which device 1 is being updated.
25	Device 1 Tag	R/W	Both	AC	10	0x20 - 0x5F for each byte	""	1.10	Tag that resides in device 1. **Note**: This value is **persistent**.
26	Device 1 Response Code/Status	R/O	System	UINT16	2	0 - 65535	0	1.10	Response code and status received from device 1.
27	Device 1 Active Alarms	R/O	System	UINT8	1	0 - 255	0	1.10	Active alarms reported by device 1.
28	Device 1 Current (mA)	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current in milliamps reported by device 1.
29	Device 1 Percent of Range	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Percent of range reported by device 1.
30 HART	Device 1 Fail Safe Enable	R/W	User	UINT8	1	0 - 1	0	1.10	Enable the use of fail safe values for the dynamic variables when the unit is reset for device 1. **Note**: This value is **persistent**.
30 HART-2	Device 1 Fail Safe Enable	R/W	User	UINT8	1	0 - 1	0	2.20	Enables, for device 1, the use of fail safe or download values for the dynamic variables when the unit detects an error. Valid values are: 0 = Live or last value 1 = Failsafe value 2 = Download value for PV, download failsafe values for other dynamic variables. **Note**: This value is **persistent**.
31	Device 1 PV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for primary variable reported by device 1.

Point Type 85: HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
32	Device 1 PV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of primary variable of device 1. **Note**: This value is **persistent**.
33	Device 1 PV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Primary fail safe on reset value for device 1. **Note**: This value is **persistent**.
34	Device 1 SV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for secondary variable reported by device 1.
35	Device 1 SV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of secondary variable of device 1. **Note**: This value is **persistent**.
36	Device 1 SV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Secondary fail safe on reset value for device 1 **Note**: This value is **persistent**..
37	Device 1 TV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for tertiary variable reported by device 1.
38	Device 1 TV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of tertiary variable of device 1. **Note**: This value is **persistent**.
39	Device 1 TV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Tertiary fail safe on reset value for device 1. **Note**: This value is **persistent**.
40	Device 1 FV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for fourth variable reported by device 1.
41	Device 1 FV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of fourth variable of device 1. **Note**: This value is **persistent**.
42	Device 1 FV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Fourth fail safe on reset value of device 1. **Note**: This value is **persistent**.
43	Device 1 Slot 0 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 0 variable to request from device 1. **Note**: This value is **persistent**.
44	Device 1 Slot 0 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 0 variable requested from device 1.
45	Device 1 Slot 0 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 0 variable requested from device 1.
46	Device 1 Slot 1 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 1 variable to request from device 1. **Note**: This value is **persistent**.
47	Device 1 Slot 1 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 1 variable requested from device 1.

Point Type 85: HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
48	Device 1 Slot 1 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 1 variable requested from device 1.
49	Device 1 Slot 2 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 2 variable to request from device 1. **Note**: This value is **persistent**.
50	Device 1 Slot 2 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 2 variable requested from device 1.
51	Device 1 Slot 2 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 2 variable requested from device 1.
52	Device 1 Slot 3 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 3 variable to request from device 1. **Note**: This value is **persistent**.
53	Device 1 Slot 3 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 3 variable requested from device 1.
54	Device 1 Slot 3 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 3 variable requested from device 1.
55	Device 1 Message	R/W	Both	AC	40	0x20 - 0x5F for each byte	""	1.10	Device 1 message.
56	Device 1 Descriptor	R/W	Both	AC	20	0x20 - 0x5F for each byte	""	1.10	Device 1 descriptor.
57	Device 1 Manufacture's ID and Device ID	R/O	System	UINT16	2	0 - 65535	0	1.10	Device 1 manufacture's ID and device's ID
58	Device 1 Serial Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.10	Device 1 serial number.
59	Device 1 ID Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.10	Device 1 ID number.
60	Device 1 Sensor Units	R/O	System	UINT8	1	0 - 255	0	1.10	Device 1 sensor units.
61	Device 1 Upper Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 1 upper sensor limit.
62	Device 1 Lower Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 1 lower sensor limit.
63	Device 1 Minimum Span	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 1 minimum sensor span.
64	Device 1 Output Units	R/O	System	UINT8	1	0 - 255	0	1.10	Device 1 Output Units
65	Device 1 Upper Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 1 upper output limit.
66	Device 1 Lower Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 1 lower output limit.
67	Device 1 Damping Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 1 damping value.

Point Type 85: HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
68 HART	Device 2 Poll Mode	R/W	User	UINT8	1	0-255	0	1.10	Polling mode for device 2. Valid values are: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables 4 = Full Update **Note**: This value is **persistent**.
68 HART-2	Device 2 Poll Mode	R/W	User	UINT8	1	Bit 7: 0-1 Bits 0-6: 0-3	0	2.20	Polling mode for device 2. Valid values are: Bit 7 (Update State): 0 = No update 1 Update Bits 0-6: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables, **Note**: This value is **persistent**.
69	Device 2 Polling Address	R/O	Both	UINT8	1	0-15	0	1.10	Polling address for device 2.
70	Device 2 Status	R/O	System	UINT8	1	0-1	0	1.10	0: No Device Found 1: Communicating
71	Device 2 Actual Scan Period	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Period at which device 2 is being updated.
72	Device 2 Tag	R/W	Both	AC	10	0x20 - 0x5F for each byte	""	1.10	Tag that resides in device 2. **Note**: This value is persistent.
73	Device 2 Response Code/Status	R/O	System	UINT16	2	0 - 65535	0	1.10	Response code and status received from device 2.
74	Device 2 Active Alarms	R/O	System	UINT8	1	0 - 255	0	1.10	Active alarms reported by device 2.
75	Device 2 Current (mA)	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current in milliamps reported by device 2.
76	Device 2 Percent of Range	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Percent of range reported by device 2.
77 HART	Device 2 Fail Safe Enable	R/W	User	UINT8	1	0 - 1	0	1.10	Enables, for device 2, the use of fail safe values for the dynamic variables when the unit resets. **Note**: This value is **persistent**.

Point Type 85: HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
77 HART-2	Device 2 Fail Safe Enable	R/W	User	UINT8	1	0 - 2	0	1.10	Enables, for device 2, the use of fail safe or download values for the dynamic variables when the unit detects an error. Valid values are: 0 = Live or last value 1 = Failsafe value 2 = Download value for PV, download failsafe values for other dynamic variables. **Note**: This value is **persistent**.
78	Device 2 PV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for primary variable reported by device 2.
79	Device 2 PV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of primary variable of device 2. **Note**: This value is **persistent**.
80	Device 2 PV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Primary fail safe on reset value for device 2. **Note**: This value is **persistent**.
81	Device 2 SV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for secondary variable reported by device 2.
82	Device 2 SV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of secondary variable of device 2. **Note**: This value is **persistent**.
83	Device 2 SV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Secondary fail safe on reset value for device 2. **Note**: This value is **persistent**.
84	Device 2 TV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for tertiary variable reported by device 2.
85	Device 2 TV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of tertiary variable of device 2. **Note**: This value is persistent.
86	Device 2 TV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Tertiary fail safe on reset value for device 2. **Note**: This value is **persistent**.
87	Device 2 FV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for fourth variable reported by device 2.
88	Device 2 FV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of fourth variable of device 2. **Note**: This value is **persistent**.
89	Device 2 FV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Fourth fail safe on reset value of device 2. **Note**: This value is **persistent**.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
90	Device 2 Slot 0 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 0 variable to request from device 2. **Note**: This value is **persistent**.
91	Device 2 Slot 0 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 0 variable requested from device 2.
92	Device 2 Slot 0 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 0 variable requested from device 2.
93	Device 2 Slot 1 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 1 variable to request from device 2. **Note**: This value is **persistent**.
94	Device 2 Slot 1 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 1 variable requested from device 2.
95	Device 2 Slot 1 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 1 variable requested from device 2.
96	Device 2 Slot 2 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 2 variable to request from device 2. **Note**: This value is **persistent**.
97	Device 2 Slot 2 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 2 variable requested from device 2.
98	Device 2 Slot 2 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 2 variable requested from device 2.
99	Device 2 Slot 3 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 3 variable to request from device 2. **Note**: This value is **persistent**.
100	Device 2 Slot 3 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 3 variable requested from device 2.
101	Device 2 Slot 3 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 3 variable requested from device 2.
102	Device 2 Message	R/W	Both	AC	40	0x20 - 0x5F for each byte	""	1.10	Device 2 message.
103	Device 2 Descriptor	R/W	Both	AC	20	0x20 - 0x5F for each byte	""	1.10	Device 2 descriptor.
104	Device 2 Manufacture's ID and Device ID	R/O	System	UINT16	2	0 - 65535	0	1.10	Device 2 manufacture's ID and device's ID
105	Device 2 Serial Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.10	Device 2 serial number.
106	Device 2 ID Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.10	Device 2 ID number.
107	Device 2 Sensor Units	R/O	System	UINT8	1	0 - 255	0	1.10	Device 2 sensor units.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
108	Device 2 Upper Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 2 upper sensor limit.
109	Device 2 Lower Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 2 lower sensor limit.
110	Device 2 Minimum Span	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 2 minimum sensor span.
111	Device 2 Output Units	R/O	System	UINT8	1	0 - 255	0	1.10	Device 2 Output Units
112	Device 2 Upper Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 2 upper output limit.
113	Device 2 Lower Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 2 lower output limit.
114	Device 2 Damping Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 2 damping value.
115 HART	Device 3 Poll Mode	R/W	User	UINT8	1	0-255	0	1.10	Polling mode for device 3. Valid values are: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables 4 = Full Update **Note**: This value is **persistent**.
115 HART-2	Device 3 Poll Mode	R/W	User	UINT8	1	Bit 7: 0-1 Bits 0-6: 0-3	0	2.20	Polling mode for device 3. Valid values are: Bit 7 (Update State): 0 = No update 1 = Update Bits 0-6: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables **Note**: This value is **persistent**.
116	Device 3 Polling Address	R/O	Both	UINT8	1	0-15	0	1.10	Polling address for device 3.
117	Device 3 Status	R/O	System	UINT8	1	0-1	0	1.10	0: No Device Found 1: Communicating
118	Device 3 Actual Scan Period	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Period at which device 3 is being updated.
119	Device 3 Tag	R/W	Both	AC	10	0x20 - 0x5F for each byte	""	1.10	Tag that resides in device 3. **Note**: This value is **persistent**.
120	Device 3 Response Code/Status	R/O	System	UINT16	2	0 - 65535	0	1.10	Response code and status received from device 3.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
121	Device 3 Active Alarms	R/O	System	UINT8	1	0 - 255	0	1.10	Active alarms reported by device 3.
122	Device 3 Current (mA)	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current in milliamps reported by device 3.
123	Device 3 Percent of Range	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Percent of range reported by device 3.
124 HART	Device 3 Fail Safe Enable	R/W	User	UINT8	1	0 - 1	0	1.10	Enables, for device 3, the use of fail safe values for the dynamic variables when the unit resets. **Note**: This value is **persistent**.
124 HART-2	Device 3 Fail Safe Enable	R/W	User	UINT8	1	0 - 2	0	2.20	Enables, for device 3, the use of fail safe or download values for the dynamic variables when the unit detects an error. Valid values are: 0 = Live or last value 1 = Failsafe value 2 = Download value for PV, download failsafe values for other dynamic variables. **Note**: This value is persistent.
125	Device 3 PV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for primary variable reported by device 3.
126	Device 3 PV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of primary variable of device 3. **Note**: This value is **persistent**.
127	Device 3 PV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Primary fail safe on reset value for device 3. **Note**: This value is persistent.
128	Device 3 SV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for secondary variable reported by device 3.
129	Device 3 SV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of secondary variable of device 3. **Note**: This value is **persistent**.
130	Device 3 SV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Secondary fail safe on reset value for device 3. **Note**: This value is **persistent**.
131	Device 3 TV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for tertiary variable reported by device 3.
132	Device 3 TV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of tertiary variable of device 3. **Note**: This value is **persistent**.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
133	Device 3 TV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Tertiary fail safe on reset value for device 3. **Note**: This value is **persistent**.
134	Device 3 FV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for fourth variable reported by device 3.
135	Device 3 FV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of fourth variable of device 3. **Note**: This value is persistent.
136	Device 3 FV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Fourth fail safe on reset value of device 3. **Note**: This value is persistent.
137	Device 3 Slot 0 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 0 variable to request from device 3. **Note**: This value is **persistent**.
138	Device 3 Slot 0 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 0 variable requested from device 3.
139	Device 3 Slot 0 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 0 variable requested from device 3.
140	Device 3 Slot 1 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 1 variable to request from device 3. **Note**: This value is **persistent**.
141	Device 3 Slot 1 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 1 variable requested from device 3.
142	Device 3 Slot 1 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 1 variable requested from device 3.
143	Device 3 Slot 2 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 2 variable to request from device 3 **Note**: This value is **persistent**.
144	Device 3 Slot 2 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 2 variable requested from device 3.
145	Device 3 Slot 2 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 2 variable requested from device 3.
146	Device 3 Slot 3 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 3 variable to request from device 3. **Note**: This value is **persistent**.
147	Device 3 Slot 3 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 3 variable requested from device 3.
148	Device 3 Slot 3 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 3 variable requested from device 3.
149	Device 3 Message	R/W	Both	AC	40	0x20 - 0x5F for each byte	""	1.10	Device 3 message.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
150	Device 3 Descriptor	R/W	Both	AC	20	0x20 - 0x5F for each byte	""	1.10	Device 3 descriptor.
151	Device 3 Manufacture's ID and Device ID	R/O	System	UINT16	2	0 - 65535	0	1.10	Device 3 manufacture's ID and device's ID
152	Device 3 Serial Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.10	Device 3 serial number.
153	Device 3 ID Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.10	Device 3 ID number.
154	Device 3 Sensor Units	R/O	System	UINT8	1	0 - 255	0	1.10	Device 3 sensor units.
155	Device 3 Upper Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 3 upper sensor limit.
156	Device 3 Lower Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 3 lower sensor limit.
157	Device 3 Minimum Span	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 3 minimum sensor span.
158	Device 3 Output Units	R/O	System	UINT8	1	0 - 255	0	1.10	Device 3 Output Units
159	Device 3 Upper Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 3 upper output limit.
160	Device 3 Lower Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 3 lower output limit.
161	Device 3 Damping Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 3 damping value.
162 HART	Device 4 Poll Mode	R/W	User	UINT8	1	0-255	0	1.10	Polling mode for device 4. Valid values are: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables 4 = Full Update **Note**: This value is **persistent**.
162 HART-2	Device 4 Poll Mode	R/W	User	UINT8	1	Bit 7: 0-1 Bits 0-6: 0-3	0	2.20	Polling mode for device 4. Valid values are: Bit 7 (Update State): 0 = No update 1 = Update Bits 0-6: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables **Note**: This value is **persistent**.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
163	Device 4 Polling Address	R/O	Both	UINT8	1	0-15	0	1.10	Polling address for device 4.
164	Device 4 Status	R/O	System	UINT8	1	0-1	0	1.10	0: No Device Found 1: Communicating
165	Device 4 Actual Scan Period	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Period at which device 4 is being updated.
166	Device 4 Tag	R/W	Both	AC	10	0x20 - 0x5F for each byte	""	1.10	Tag that resides in device 4. **Note**: This value is **persistent**.
167	Device 4 Response Code/Status	R/O	System	UINT16	2	0 - 65535	0	1.10	Response code and status received from device 4.
168	Device 4 Active Alarms	R/O	System	UINT8	1	0 - 255	0	1.10	Active alarms reported by device 4.
169	Device 4 Current (mA)	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current in milliamps reported by device 4.
170	Device 4 Percent of Range	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Percent of range reported by device 4.
171 HART	Device 4 Fail Safe on Reset Enable	R/W	User	UINT8	1	0 - 1	0	1.10	Enables, for device 4, the use of fail safe values for the dynamic variables when the unit resets. **Note**: This value is **persistent**.
171 HART-2	Device 4 Fail Safe on Reset Enable	R/W	User	UINT8	1	0 - 2	0	2.20	Enables, for device 4, the use of fail safe or download values for the dynamic variables when the unit detects an error. Valid values are: 0 = Live or last value 1 = Failsafe value 2 = Download value for PV, download failsafe values for other dynamic variables. **Note**: This value is **persistent**.
172	Device 4 PV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for primary variable reported by device 4.
173	Device 4 PV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of primary variable of device 4. **Note**: This value is **persistent**.
174	Device 4 PV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Primary fail safe on reset value for device 4. **Note**: This value is **persistent**.
175	Device 4 SV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for secondary variable reported by device 4.
176	Device 4 SV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of secondary variable of device 4. **Note**: This value is persistent.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
177	Device 4 SV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Secondary fail safe on reset value for device 4. **Note**: This value is **persistent**.
178	Device 4 TV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for tertiary variable reported by device 4.
179	Device 4 TV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of tertiary variable of device 4. **Note**: This value is **persistent**.
180	Device 4 TV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Tertiary fail safe on reset value for device 4. **Note**: This value is **persistent**.
181	Device 4 FV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for fourth variable reported by device 4.
182	Device 4 FV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of fourth variable of device 4. **Note**: This value is **persistent**.
183	Device 4 FV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Fourth fail safe on reset value of device 4. **Note**: This value is **persistent**.
184	Device 4 Slot 0 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 0 variable to request from device 4. **Note**: This value is **persistent**.
185	Device 4 Slot 0 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 0 variable requested from device 4.
186	Device 4 Slot 0 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 0 variable requested from device 4.
187	Device 4 Slot 1 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 1 variable to request from device 4. **Note**: This value is **persistent**.
188	Device 4 Slot 1 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 1 variable requested from device 4.
189	Device 4 Slot 1 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 1 variable requested from device 4.
190	Device 4 Slot 2 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 2 variable to request from device 4. **Note**: This value is persistent.
191	Device 4 Slot 2 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 2 variable requested from device 4.
192	Device 4 Slot 2 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 2 variable requested from device 4.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
193	Device 4 Slot 3 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 3 variable to request from device 4. **Note**: This value is **persistent**.
194	Device 4 Slot 3 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 3 variable requested from device 4.
195	Device 4 Slot 3 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 3 variable requested from device 4.
196	Device 4 Message	R/W	Both	AC	40	0x20 - 0x5F for each byte	""	1.10	Device 4 message.
197	Device 4 Descriptor	R/W	Both	AC	20	0x20 - 0x5F for each byte	""	1.10	Device 4 descriptor.
198	Device 4 Manufacture's ID and Device ID	R/O	System	UINT16	2	0 - 65535	0	1.10	Device 4 manufacture's ID and device's ID
199	Device 4 Serial Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.10	Device 4 serial number.
200	Device 4 ID Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.10	Device 4 ID number.
201	Device 4 Sensor Units	R/O	System	UINT8	1	0 - 255	0	1.10	Device 4 sensor units.
202	Device 4 Upper Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 4 upper sensor limit.
203	Device 4 Lower Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 4 lower sensor limit.
204	Device 4 Minimum Span	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 4 minimum sensor span.
205	Device 4 Output Units	R/O	System	UINT8	1	0 - 255	0	1.10	Device 4 Output Units
206	Device 4 Upper Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 4 upper output limit.
207	Device 4 Lower Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 4 lower output limit.
208	Device 4 Damping Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 4 damping value.
209 HART	Device 5 Poll Mode	R/W	User	UINT8	1	0-255	0	1.10	Polling mode for device 5. Valid values are: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables 4 = Full Update **Note**: This value is **persistent**.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
209 HART-2	Device 5 Poll Mode	R/W	User	UINT8	1	Bit 7: 0-1 Bits 0-6: 0-3	0	2.20	Polling mode for device 5. Valid values are: Bit 7 (Update State): 0 = No update 1 = Update Bits 0-6: 0 = Skip This Device 1 = Primary Variable Only 2 = All Dynamic Variables 3 = All Slot Variables **Note**: This value is **persistent**.
210	Device 5 Polling Address	R/O	Both	UINT8	1	0-15	0	1.10	Polling address for device 5.
211	Device 5 Status	R/O	System	UINT8	1	0-1	0	1.10	0: No Device Found 1: Communicating
212	Device 5 Actual Scan Period	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Period at which device 5 is being updated.
213	Device 5 Tag	R/W	Both	AC	10	0x20 - 0x5F for each byte	""	1.10	Tag that resides in device 5. **Note**: This value is persistent.
214	Device 5 Response Code/Status	R/O	System	UINT16	2	0 - 65535	0	1.10	Response code and status received from device 5.
215	Device 5 Active Alarms	R/O	System	UINT8	1	0 - 255	0	1.10	Active alarms reported by device 5.
216	Device 5 Current (mA)	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current in milliamps reported by device 5.
217	Device 5 Percent of Range	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Percent of range reported by device 5.
218 HART	Device 5 Fail Safe on Reset Enable	R/W	User	UINT8	1	0 - 1	0	1.10	Enables, for device 5, the use of fail safe values for the dynamic variables when the unit resets. **Note**: This value is **persistent**.
218 HART-2	Device 5 Fail Safe on Reset Enable	R/W	User	UINT8	1	0 - 2	0	2.20	Enables, for device 5, the use of fail safe or download values for the dynamic variables when the unit detects an error. Valid values are: 0 = Live or last value 1 = Failsafe value 2 = Download value for PV, download failsafe values for other dynamic variables. **Note**: This value is **persistent**.
219	Device 5 PV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for primary variable reported by device 5.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
220	Device 5 PV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of primary variable of device 5. **Note**: This value is **persistent**.
221	Device 5 PV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Primary fail safe on reset value for device 5. **Note**: This value is **persistent**.
222	Device 5 SV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for secondary variable reported by device 5.
223	Device 5 SV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of secondary variable of device 5. **Note**: This value is **persistent**.
224	Device 5 SV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Secondary fail safe on reset value for device 5. **Note**: This value is **persistent**.
225	Device 5 TV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for tertiary variable reported by device 5.
226	Device 5 TV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of tertiary variable of device 5. **Note**: This value is **persistent**.
227	Device 5 TV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Tertiary fail safe on reset value for device 5. **Note**: This value is **persistent**.
228	Device 5 FV Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units code for fourth variable reported by device 5.
229	Device 5 FV	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of fourth variable of device 5. **Note**: This value is **persistent**.
230	Device 5 FV Fail Safe on Reset Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Fourth fail safe on reset value of device 5. **Note**: This value is **persistent**.
231	Device 5 Slot 0 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 0 variable to request from device 5. **Note**: This value is **persistent**.
232	Device 5 Slot 0 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 0 variable requested from device 5.
233	Device 5 Slot 0 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 0 variable requested from device 5.
234	Device 5 Slot 1 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 1 variable to request from device 5. **Note**: This value is **persistent**.
235	Device 5 Slot 1 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 1 variable requested from device 5.

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
236	Device 5 Slot 1 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 1 variable requested from device 5.
237	Device 5 Slot 2 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 2 variable to request from device 5. **Note**: This value is **persistent**.
238	Device 5 Slot 2 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 2 variable requested from device 5.
239	Device 5 Slot 2 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 2 variable requested from device 5.
240	Device 5 Slot 3 Assignment	R/W	User	UINT8	1	0 - 255	0	1.10	Slot 3 variable to request from device 5. **Note**: This value is persistent.
241	Device 5 Slot 3 Units	R/O	System	UINT8	1	0 - 255	0	1.10	Units of slot 3 variable requested from device 5.
242	Device 5 Slot 3 Variable	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value of slot 3 variable requested from device 5.
243	Device 5 Message	R/W	Both	AC	40	0x20 - 0x5F for each byte	""	1.10	Device 5 message.
244	Device 5 Descriptor	R/W	Both	AC	20	0x20 - 0x5F for each byte	""	1.10	Device 5 descriptor.
245	Device 5 Manufacture's ID and Device ID	R/O	System	UINT16	2	0 - 65535	0	1.10	Device 5 manufacture's ID and device's ID
246	Device 5 Serial Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.10	Device 5 serial number.
247	Device 5 ID Number	R/O	System	UINT32	4	0 - 4,294,967,295	0	1.10	Device 5 ID number.
248	Device 5 Sensor Units	R/O	System	UINT8	1	0 - 255	0	1.10	Device 5 sensor units.
249	Device 5 Upper Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 5 upper sensor limit.
250	Device 5 Lower Sensor Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 5 lower sensor limit.
251	Device 5 Minimum Span	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 5 minimum sensor span.
252	Device 5 Output Units	R/O	System	UINT8	1	0 - 255	0	1.10	Device 5 Output Units
253	Device 5 Upper Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 5 upper output limit.
254	Device 5 Lower Output Limit	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 5 lower output limit.

Point Type 85: HART

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
255	Device 5 Damping Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Device 5 damping value.

3.4.20 Point Type 91: System Variables:

Description: Point type 91 provides parameters for configuring system variables.
Number of Logical Points: 1 logic point for System Variables may exist.
Storage Location: Point type 91 is saved to internal configuration memory.

Table 3-21: Point Type 91, System Variables

Point Type 91: System Variables

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	ROC Address	R/W	User	UINT8	1	0 →255	1	1.10	One-byte unit code of the station address. The unit code for a ROC address is configurable by the user. A 0 is used for broadcast and should not be used by the ROC.
1	ROC Group	R/W	User	UINT8	1	0 →255	2	1.10	Group code of the station address.
2	Station Name	R/W	User	AC	20	0x20→0x7E for each byte	'Remote Oprtns Cntrlr'	1.10	A 20-character ASCII field for the station name.
3	Part Number and Version	R/O	System	AC	20	0x20 → 0x7E for each byte	'W68xxx Ver y.yy'	1.10	The software part number and version number string.
4	Time Created	R/O	System	AC	20	0x20 → 0x7E for each byte	'mmm dd, yyyy HH:MM'	1.10	The time and date stamp the firmware was created.
5	Manufacturer ID	R/O	System	AC	20	0x20 → 0x7E for each byte	'Emerson Process Mgmt'	1.10	The manufacturing identification string.
6	Product Description	R/O	System	AC	20	0x20 → 0x7E for each byte	'DL8000 '	1.10	The manufacturing description of product.
7	Serial Number	R/O	System	UINT32	4	0x0→ 0xFFFFFFFF	0xFFFFFFFF	1.10	The serial number for the unit.
8	Maximum Events	R/O	System	UINT16	2	450	450	1.10	The maximum number of events that the Event Log may store.
9	Maximum Alarms	R/O	System	UINT16	2	450	450	1.10	The maximum number of alarms that the Alarm Log may store.
10	Maximum PIDs	R/O	System	UINT8	1	0 →16	16	1.10	The maximum number of PID loops that may run on the system
11	Unused	R/O	System	UINT8	1	0	0	1.10	Unused
12	Maximum FSTs	R/O	System	UINT8	1	6	6	1.10	The maximum number of FSTs that may run on the system
13	Event Index	R/O	System	UINT16	2	0 → 449	0	1.10	The current event index for the Event Log.

Point Type 91: System Variables

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
14	Alarm Index	R/O	System	UINT16	2	0 → 449	0	1.10	The current alarm index in the Alarm Log.
15	Active PIDs	R/W	System	UINT8	1	0 → 16	16	1.10	Number of active PIDs
16	Unused	R/W	User	UINT8	1	0	0	1.10	Unused
17	Unused	R/W	User	UINT8	1	0	0	1.10	Unused
18	Unused	R/W	User	UINT8	1	0	0	1.10	Unused
19	FST Clear	R/W	User	UINT8	1	0 → 1	0	1.10	Setting this parameter clears All FST code from Flash ROM. 0 – Does nothing. 1 – Initiates clearing of FST code.
20	Clear configuration memory	R/W	User	UINT8	1	0 → 1	0	1.10	Used to clear the internal configuration memory stored in flash ROM. 0 = Do nothing 1 = Enable clearing of Configuration Memory
21	Write to Configuration Memory	R/W	User	UINT8	1	0 → 1	0	1.10	Used to command the ROC to store certain point types (indicated throughout this document) to flash configuration memory 0 = Do nothing 1 = Perform Write to Configuration Memory
22	Configuration Memory Write Complete	R/O	System	UINT8	1	0 → 1	1	1.10	Indicated the system is the process of writing the configuration to flash ROM 0 = Currently Performing the Write 1 = Completed the Write
23	MPU Loading	R/O	System	FL	4	0.0 →100.0	0.0	1.10	The current percentage of time the CPU is being loaded, updated every 5 seconds.
24	Unused	R/W	User	UINT8	1	0	0	1.10	Unused
25	I/O Scanning	R/W	User	UINT8	1	0 → 1	1	1.10	Used to enable or disable scanning of all I/O in the system. 0 = Disabled, 1 = Enabled.
26	Warm Start	R/W	User	UINT8	1	0 → 1	0	1.10	Used to re-start the system. A warm start is a reboot of the system without performing all the power-on-self tests. 0 = Do nothing 1 = Perform Warm Start

Point Type 91: System Variables

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
27	Cold start	R/W	User	UINT8	1	0 → 7	0	1.10	Used to re-start the system. A cold start always includes starting from the boot sector and performing power-on-self tests, plus the following options. 0 = Do nothing 1 = Restore Configuration from Flash 2 = Clear Alarms 3 = Clear Events 4 = Clear FSTs 5 = Clear History Data 6 = Restore Configuration from Flash, Clear Alarms/Events/FSTs/History Data 7 = Restore Configuration from Defaults
28	Unused	R/O	User	UINT8	1	0	0	1.10	Unused
29	Unused	R/W	User	UINT8	1	0	0	1.10	Unused
30	Display Power Save Time	R/W	User	UINT8	1	0→255	0	1.10	Enables or disables the power saving feature of the LCD. 0 – Disable Power Saving, >0 Enable Power Saving. When set to anything greater than 0, it is the number of minutes of inactivity are required before placing the LCD into sleep. The first key press will wakeup the display.
31	Baud Rate Generator #0 Rate	R/W	User	UINT32	4	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	19200	2.20	The baud rate that baud rate generator #0 is to be set to.
32	Baud Rate Generator #1 Rate	R/W	User	UINT32	4	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	9600	2.20	The baud rate that baud rate generator #1 is to be set to.
33	Baud Rate Generator #2 Rate	R/W	User	UINT32	4	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	38400	2.20	The baud rate that baud rate generator #2 is to be set to.
34	Baud Rate Generator #3 Rate	R/W	User	UINT32	4	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	57600	2.20	The baud rate that baud rate generator #3 is to be set to.

Point Type 91: System Variables

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
35	CRC Check	R/W	User	UINT8	1	0 → 1	1	1.10	The CRC check flag. If this flag is enabled, a CRC will be appended to all messages and a CRC will be expected on all received messages. Disabled = 0, Enabled = 1. Note: Ethernet communications will ignore the CRC since TCP/IP protocol already does error checking. **Note**: The CRC must still be sent over Ethernet communications.
36	LED Enable	R/W	User	UINT8	1	0 → 60	5	1.10	Indicates the number of minutes the LEDs will be on before automatically turning themselves off. (The LED button will active the LEDs for the configured time). 0 = LEDs always on 1 - 60 = Number of minutes LEDs will be on
37	Boot Part Number and Version	R/O	System	AC	20	0x20 → 0x7E for each byte	'W68xxx Ver y.yy'	1.10	Contains the boot software part number and version number string.
38	Boot Firmware Time Created	R/O	System	AC	20	0x20 → 0x7E for each byte	'mmm dd, yyyy HH:MM'	1.10	Contains the time and date stamp that the boot firmware was created.
39	Unused	R/W	User	UINT8	1	0	0	1.10	Unused
40	Clear History	R/W	User	UINT8	1	0 → 1	0	1.10	Clears history database and resets configuration back to factory defaults without power cycling the ROC. Don't clear = 0, Clear = 1.
41	Flash Disk Space Used	R/O	System	UINT32	4	0 → 0xFFFFFFFF	varies	1.10	The amount of disk space that has been consumed.
42	Flash Disk Space Free	R/O	System	UINT32	4	0 → 0xFFFFFFFF	varies	1.10	The amount of disk space that is available.
43	Number of System Initializations	R/W	Both	UINT16	2	0 → 65535	0	1.10	The number of system initializations. **Note**: This parameter does not reset to defaults on a cold start, but does reset on a firmware upgrade.
44	Number of Warm Starts	R/W	Both	UINT16	2	0 → 65535	0	1.10	The number of warm starts. **Note**: This parameter does not reset to defaults on a cold start, but does reset on a firmware upgrade.
45	Number of Cold Starts	R/W	Both	UINT16	2	0 → 65535	0	1.10	The number of cold starts. **Note**: This parameter does not reset to defaults on a cold start, but does reset on a firmware upgrade.

Point Type 91: System Variables

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
46	Number of Power Cycles	R/W	Both	UINT16	2	0 → 65535	0	1.10	The number of power cycles. **Note**: This parameter does not reset to defaults on a cold start, but does reset on a firmware upgrade.
47	Last Power-Down Time	R/O	System	TIME	4	N/A	0	1.10	Contains the last power-down time in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
48	Last Power-Up Time	R/O	System	TIME	4	N/A	0	1.10	Contains the last power-up time in the number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
49	Auto Logout Period	R/W	User	UINT8	1	0 → 255	30	1.10	The time out period for the keypad auto logout. This is in minutes.
50	Logical Compatibility Mode	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates the logical compatibility mode. 0 = 16 points per slot [Opcode 50 information and logical indexing for I/O is used in the same way as with version 1.XX of firmware] 1 = 8 points per slot [Opcode 50 information and logical indexing for I/O is based on 8 points per module and allows for up to 27 modules to be accessed.] See Opcode 50 for more information.
51	RESERVED	R/O	System	UINT8	1		0	1.10	Reserved for future use
52	Weights and Measures Maximum Events	R/O	System	UINT16	2	1000	1000	1.10	The maximum number of events that the Weights and Measures Event Log may store.
53	Weights and Measures Event Index	R/O	System	UINT16	2	0 → 999	0	1.10	The current event index for the Weights and Measures Event Log.
54	RocSeries	R/O	System	AC20	20	0x20 → 0x7E for each byte	Series 2	2.20	Indicates the version of hardware.
55	Num Active Virtual DO	R/W CNDL	User	UINT8	1	0 →24	0	2.20	Indicates the number of active virtual DO points.
56	System Rollover for Double Precision Parameters	R/W CNDL	User	Double	8	Any positive valid IEEE double precision float → 2.996×10^{308}	1,000,000	2.20	Sets the value at which the double precision accumulators roll over.

3.4.21 Point Type 92: Logon Parameters

Description: Point type 92 is the Logon Parameters for logging onto the DL8000.

Number of Logical Points: 32 logical points for Logon Parameters may exist.

Storage Location: Point type 92 is saved to internal configuration memory.

Table 3-22: Point Type 92, Logon Parameters

Point Type 92: Logon Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Operator Identifier	R/W	User	AC	3	0x20 → 0x7E for each byte.	See note	1.10	A three character ASCII operator identifier (i.e. LOI). **Note**: The first point (logical 0) defaults to operator ID **LOI** and password **1000**. The remaining 15 points default to operator id ' ' and password **0000**.
1	Unused #1	R/O	User	UINT8	1	0	0	1.10	Note: This has been redefined in version 1.10.
2	Unused #2	R/O	User	UINT8	1	0	0	1.10	Note: This has been redefined in version 1.10.
3	Unused #3	R/O	User	UINT8	1	0	0	1.10	Note: This has been redefined in version 1.10.
4	Password	W/O	User	UINT16	2	0000 → 9999	See note	1.20	A numerical value that is used as a password for the Operator Identifier (i.e. 1000). For version 1.20 and later, this field is write-only. Reading this value now always returns 0. **Note**: The first point (logical 0) defaults to operator ID **LOI** and password **1000**. The remaining 15 points default to operator id ' ' and password **0000**.
5	Access Level	R/W	User	UINT8	1	0→ 255	0	1.10	A value that is used to limit access to parameters when parameter (95, x, 44) is set to 2 (Security by User Access Level) where x = to the logical of the port that the request is being made on.
6	Group #1	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
7	Group #2	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.

Point Type 92: Logon Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
8	Group #3	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
9	Group #4	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
10	Group #5	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
11	Group #6	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
12	Group #7	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
13	Group #8	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
14	Group #9	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
15	Group #10	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
16	Group #11	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
17	Group #12	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
18	Group #13	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
19	Group #14	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
20	Group #15	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
21	Group #16	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.

Point Type 92: Logon Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
22	Group #17	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
23	Group #18	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
24	Group #19	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.
25	Group #20	R/W	User	UINT8	1	0→19,255	255	1.10	States the first group the user is a member. The Group is then mapped to PT123 Logical 1, Parameters 0→19.

3.4.22 Point Type 95: Communication Port Parameters

Description: Point type 95 provides parameters for configuring a communication port. Only the following parameters are valid for logical 1 (Ethernet port):

- ROC Plus Protocol Valid Receive Counter
- ROC Plus Protocol successful message time
- Transmit counter
- ROC Plus Protocol Security Status

All other parameters for logical 1 cannot be modified.

Number of Logical Points: 6 logical points for Communication Ports may exist.

Storage Location: Point type 95 is saved to internal configuration memory.

Table 3-23: Point Type 95, Communication Ports

Point Type 95: Communication Ports

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag Identification	R/W	User	AC	10	0x20 → 0x7E for each byte	"Local Port", "COMM1" → "COMM5"	1.10	The customizable name for this communications port.
1	Baud Rate Generator Used	R/W	User	UINT16	2	0→ 3	0	1.10	The baud rate generator used by this com port. Each port may use a different generator, however, only 4 generators exist. See Point Type 91, System Variables, parameters 31-34.
2	Stop Bits	R/W	User	UINT8	1	1,2	1	1.10	The number of stop bits in a character.
3	Data Bits	R/W	User	UINT8	1	7, 8	8	1.10	The number of data bits in a character.
4	Parity	R/W	User	UINT8	1	0 →2	0	1.10	For parity error checking, the host adds a 1 or 0 bit to the character to make it even or odd. The receiver then decodes this. An error occurs if the sum of the bits is not correct. None = 0, Odd = 1, Even = 2.

Point Type 95: Communication Ports

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Comm Type	R/O	System	UINT8	1	0, 9→13, 15	LOI: 10 COMM1: 15 COMM2: 10 COMM3: 0 COMM4: 0 COMM5: 0	1.10	Indicates the type of comm module installed. Valid values are: 0 = No Comm Module Installed 9 = MVS 10 = RS-232 11 = RS-485 12 = Modem 13 = HART 15 = Ethernet (Versions Prior to 1.10) 19 = Ethernet (Versions 1.10 and later) This parameter is updated whenever the system detects the insertion or removal of a module.
6	Store and forward port	R/W	User	UINT8	1	0 → 1	COMM1: 1 All others: 0	1.10	If this is enabled all store and forward messages will be sent out this port. If it is disabled, none will be sent. 0 = Do not store and forward for this port 1 = Store and forward for this port.
7	Key On Delay	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	LOI: 0.0 Others: 0.01	1.10	The period to wait after turning the RTS signal on before a message can be sent. This value is in seconds.
8	Key Off Delay	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	LOI: 0.0 Others: 0.01	1.10	The period to delay turning the RTS signal off after a message has been sent. This value is in seconds.
9	Modem Status	R/O	System	UINT8	1	0→ 255	0	1.10	This is the numeric response from the modem. A non-Hayes compatible modem will not provide this information. 0 = OK.
10	Modem Type	R/W	Both	UINT8	1	0 →2	0	1.10	The type of modem. The internal modem will be detected and changed by the ROC. 0 = None, 1 = External, 2 = Internal. Note: 2 can not be written by the user.
11	Connect Time	R/W	User	FL	4	0.0 → Max positive IEEE 754 float	60.0	1.10	The amount of time in seconds the ROC800-Series waits after initiating a call to receive a connect message before terminating a call. 0 disables.
12	Configuration Command	R/W	User	AC	40	0x20 → 0x7E for each byte	“AT&F0E0H 0V0X0&K3 S0=1S7=25 5S24=60”	1.10	The commands needed to initialize a modem.
13	Connect Command	R/W	User	AC	40	0x20 → 0x7E for each byte	“ATDT (number)”	1.10	The Hayes compatible modem command needed to dial out for SRBX communications.

Point Type 95: Communication Ports

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
14	Disconnect Time	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	60.0	1.10	Time in seconds that the ROC800-Series will wait before disconnecting if there is no activity. 0 disables.
15	Inactivity Time	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	900.0	1.10	Time in seconds that the ROC800-Series will wait, without receiving a signal, before it resets the modem. The inactivity timer looks at the valid receive counter to determine if the signal has been received. 0 disables.
16	Modem disconnect command	R/W	User	AC	40	0x20 → 0x7E for each byte	“ATH0”	1.10	The user can use a different disconnect string for a modem.
17	SRBX Status	R/O	System	UINT8	1	0 → 1	0	1.10	0 = SRBX is currently inactive 1 = SRBX is currently active for this port
18	Enable SRBX	R/W	User	UINT8	1	0 → 1	0	1.10	If this is enabled all SRBX messages will be sent out this port. If is disabled, none will be sent. 0 = Disable SRBX for this port 1 = Enable SRBX for this port
19	SRBX Alarm Index	R/O	System	UINT16	2	0 → [PT 91, parameter 10]	0	1.10	The index into the alarm table that corresponds to the alarm that caused an SRBX.
20	SRBX Time Base #1	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	20.0	1.10	Time in seconds that the ROC800-Series will use as the 1st SRBX delay.
21	SRBX Attempts #1	R/W	User	UINT8	1	0 → 255	1	1.10	The number of attempts for the 1st SRBX to use. 0 = disable, 255 = continuous.
22	SRBX Time Base #2	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	30.0	1.10	Time in seconds that the ROC800-Series will use as the 2nd SRBX delay.
23	SRBX Attempts #2	R/W	User	UINT8	1	0 → 255	2	1.10	The number of attempts for the 2nd SRBX to use. 0 = disable, 255 = continuous.
24	SRBX Time Base #3	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	45.0	1.10	Time in seconds that the ROC800-Series will use as the 3rd SRBX delay.
25	SRBX Attempts #3	R/W	User	UINT8	1	0 → 255	3	1.10	The number of attempts for the 3rd SRBX to use. 0 = disable, 255 = continuous.
26	SRBX Host Address	R/W	User	UINT8	1	0 → 255	1	1.10	Used to identify the SRBX host – Address portion.
27	SRBX Host Group	R/W	User	UINT8	1	0 → 255	0	1.10	Used to identify the SRBX host – Group portion.
28	Store & Forward Address #1	R/W	User	UINT8	1	0 → 255	0	1.10	Address of the 1st destination for the store and forward path. SRBX must be enabled for this to function.

Point Type 95: Communication Ports

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
29	Store & Forward Group #1	R/W	User	UINT8	1	0 → 255	0	1.10	Group number of the 1st destination for the store and forward path. SRBX must be enabled for this to function.
30	Store & Forward Address #2	R/W	User	UINT8	1	0 → 255	0	1.10	Address of the 2nd destination for the store and forward path. SRBX must be enabled for this to function.
31	Store & Forward Group #2	R/W	User	UINT8	1	0 → 255	0	1.10	Group number of the 2nd destination for the store and forward path. SRBX must be enabled for this to function.
32	Store & Forward Address #3	R/W	User	UINT8	1	0 → 255	0	1.10	Address of the 3rd destination for the store and forward path. SRBX must be enabled for this to function.
33	Store & Forward Group #3	R/W	User	UINT8	1	0 → 255	0	1.10	Group number of the 3rd destination for store and forward. SRBX must be enabled for this to function.
34	Unused	R/O	User	UINT8	1	0	0	1.10	Not currently used.
35	Unused	R/O	User	UINT8	1	0	0	1.10	Not currently used.
36	ROC Plus Protocol Valid Receive Counter	R/W	Both	UINT16	2	0 → 65535	0	1.10	The number of valid ROC Plus Protocol messages received by the ROC for this port. It can be cleared by the user.
37	ROC Plus Protocol successful message time	R/O	System	TIME	4	0x0→ 0xFFFFFFFF	0x386D97E 0	1.10	The time of the last successful Opcode received by the ROC800-Series. Indicated by the number of seconds since midnight Jan 1, 1970.
38	Modbus Valid Receive Counter	R/W	Both	UINT16	2	0 → 65535	0	1.10	The number of valid Modbus messages received by the ROC for this port. It can be cleared by the user.
39	Modbus successful message time	R/O	System	TIME	4	0x0→ 0xFFFFFFFF	0x386D97E 0	1.10	The time of the last successful function code received by the ROC800-Series. Indicated by the number of seconds since midnight Jan 1, 1970.
40	Number of invalid message bytes	R/W	Both	UINT16	2	0 → 65535	0	1.10	The number of invalid ROC Plus Protocol or Modbus bytes received. This parameter will always return 0 for logical 1.
41	Invalid message byte time	R/O	System	TIME	4	0x0→ 0xFFFFFFFF	0x386D97E 0	1.10	The time of the last unsuccessful message byte was received by the ROC800-Series. Indicated by the number of seconds since midnight Jan 1, 1970. This parameter will always return 0 for logical 1.

Point Type 95: Communication Ports

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
42	Transmit counter	R/W	Both	UINT16	2	0 → 65535	0	1.10	Number of messages sent.
43	Port owner	R/W	Both	UINT8	1	0 → 255	0	1.10	Indicates the program currently owning the port. Messages will be routed directly to the owner, bypassing the ROC Plus protocol. The owner will not be allowed to be changed if an MVS module is installed on the port. Valid values are : 0 = ROC Plus Protocol / Modbus Slave 1 = Modbus Master (Comm 1 – 5) 2 = DS800 (Not Valid for Comm 1 on ROC809E) 3 = LCD 4 = I/O Module (Read Only) 5 = User C++ Program 1 6 = User C++ Program 2 7 = User C++ Program 3 8 = User C++ Program 4 9 = User C++ Program 5 10 = User C++ Program 6 11 = User C++ Program 7 12 = User C++ Program 8 50 = ROC Plus Protocol Only 51 = Modbus Slave Only 52 = LCD/Roc Plus Protocol (Added 1.10)
44	ROC Plus Protocol Security Status	R/W	User	UINT8	1	0 → 2	0	 1.10 1.10 1.10	Enables security for the communications port. Disabled = 0 Security by User ID = 1 Security by User Access Level = 2
45	RESERVED	R/O	System	UINT8	1		0	1.10	Reserved for future use
46	RESERVED	R/O	User	UINT32	4		5000	1.10	Reserved for future use
47	Security Inactivity Timeout	R/W	User	UINT32	4	60 → 86400	3600	2.20	Indicates the number of seconds before the user is logged out because of inactivity.

3.4.23 Point Type 96: FST Parameters

Description: Point type 96 provides parameters to set up an FST or that are used by the FST.

Number of Logical Points: 6 logical points for FST Parameters may exist.

Storage Location: Point type 96 is saved to internal configuration memory.

Table 3-24: Point Type 96, FST Parameters

Point Type 96: FST Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	10	0x20 → 0x7E for each byte	"FSTx"	1.10	This field contains a string to describe the FST. "X" in default name is a number that correlates to the FST logical number.
1	Result Register (RR)	R/W	System	FL	4	Any valid IEEE 754 float	0	1.10	Register used to store result of last FST operation.
2	Register 1 (R1)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.10	Register used as an input to an FST or as a location to store FST data.
3	Register 2 (R2)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.10	Register used as an input to an FST or as a location to store FST data.
4	Register 3 (R3)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.10	Register used as an input to an FST or as a location to store FST data.
5	Register 4 (R4)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.10	Register used as an input to an FST or as a location to store FST data.
6	Register 5 (R5)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.10	Register used as an input to an FST or as a location to store FST data.
7	Register 6 (R6)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.10	Register used as an input to an FST or as a location to store FST data.
8	Register 7 (R7)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.10	Register used as an input to an FST or as a location to store FST data.
9	Register 8 (R8)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.10	Register used as an input to an FST or as a location to store FST data.
10	Register 9 (R9)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.10	Register used as an input to an FST or as a location to store FST data.
11	Register 10 (R10)	R/W	Both	FL	4	Any valid IEEE 754 float	0	1.10	Register used as an input to an FST or as a location to store FST data.
12	Timer #1	R/W	Both	UINT32	4	0 → 4294967295	0	1.10	Time left for count down timer. Timer resolution is 100ms.

Point Type 96: FST Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
13	Timer #2	R/W	Both	UINT32	4	0 → 4294967295	0	1.10	Time left for count down timer. Timer resolution is 100ms.
14	Timer #3	R/W	Both	UINT32	4	0 → 4294967295	0	1.10	Time left for count down timer. Timer resolution is 100ms.
15	Timer #4	R/W	Both	UINT32	4	0 → 4294967295	0	1.10	Time left for count down timer. Timer resolution is 100ms.
16	Message #1	R/W	System	AC	30	0x20 → 0x7E for each byte	“”	1.10	This parameter is updated with the first argument of the ‘MSG’ FST command when the command executes. This description has changed for version 1.10.
17	Message #2	R/W	User	AC	30	0x20 → 0x7E for each byte	“”	1.10	This parameter is updated with the first argument of the ‘MS2’ FST command when the command executes. This description has changed for version 1.10.
18	Message Data #1	R/O	System	AC	10	0x2D, 0x2E, 0x30 → 0x39 for each byte	“0.0”	1.10	This parameter is updated with the second argument of the ‘MSG’ FST command when the command executes. This description has changed for version 1.10.
19	Miscellaneous 1	R/W	Both	UINT8	1	0 → 255	0	1.10	Single byte register that may be used by an FST.
20	Miscellaneous 2	R/W	Both	UINT8	1	0 → 255	0	1.10	Single byte register that may be used by an FST.
21	Miscellaneous 3	R/W	Both	UINT8	1	0 → 255	0	1.10	Single byte register that may be used by an FST.
22	Miscellaneous 4	R/W	Both	UINT8	1	0 → 255	0	1.10	Single byte register that may be used by an FST.
23	Compare Flag (SVD)	R/W	System	UINT8	1	0 → 255	0	1.10	Stores the result of a Boolean expression. 0 – FALSE 1 – TRUE
24	Run Status	R/W	Both	UINT8	1	0, 1, 5, 8, 9	0	1.10	This parameter stores the run state of the FST. 0 – FST is not running. 1 – FST is running. 5 – Indicates FST has shut down due to an invalid point reference. 8 – FST Editor initiates the Trace mode. 9 – Indicates that the FST in ROC800 is processing.
25	Code Size	R/O	System	UINT16	2	0 – 3000	0	1.10	Size, in bytes, of the FST code. This size does not include storage needed for register names, description, or version.

Point Type 96: FST Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
26	Instruction Pointer	R/W	System	UINT16	2	0 – 3000	0	1.10	Contains the location of the FST function to be executed next. If an error occurs, the Instruction Pointer will be set to the location of the parameter that caused the error. This parameter may also be called a program counter.
27	Execution Delay	R/W	User	UINT16	2	0 → 65535	0	1.10	Execution delay between FST instructions. Resolution is tenths of a second.
28	FST Version	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.10	Stores information about the version of the FST code. The user sets this before the FST is uploaded to the ROC800.
29	FST Description	R/O	System	AC	40	0x20 → 0x7E for each byte	“”	1.10	Contains a short description about the FST that is running. The user sets this before the FST is uploaded to the ROC800.
30	Message Data #2	R/O	System	AC	10	0x2D, 0x2E, 0x30 → 0x39 for each byte	“0.0”	1.10	This parameter is updated with the second argument of the ‘MS2’ FST command when the command executes. This description has changed for version 1.10.
31	Steps / Task Cycle	R/W	User	UINT8	1	0 → 250	20	1.10	The requested number of steps to be executed each cycle of the FST task for this FST. The FST task nominally runs every 100 ms.
32	Actual Steps / Task Cycle	R/O	System	UINT8	1	0 → 250	20	1.10	The actual number of FST steps that the ROC800 executed for this FST during the most recent cycle of the FST task.
33	FST Cycle Time	R/O	System	FL	4	0 → Any valid positive IEEE 754 float	0.0	1.10	The amount of time in seconds from the beginning of the last execution of the FST (step 1) to the beginning of the current execution (step 1).

3.4.24 Point Type 97: FST Register Tags

Description: Point Type 97 provides parameters for entering the register tags for FST data. Each register name corresponds to a register in point type 96. It is only broken apart because of the length of the point type.

Number of Logical Points: 6 logical points for FST Register Tags may exist.

Storage Location: Point type 97 is saved to internal configuration memory.

Table 3-25: Point Type 97, FST Register Tags

Point Type 97: FST Register Tags

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Register Tag 1	R/W	System	AC	10	0x20 → 0x7E for each byte	“Register1”	1.10	Text string used as a label for Register 1 (R1).
1	Register Tag 2	R/W	System	AC	10	0x20 → 0x7E for each byte	“Register2”	1.10	Text string used as a label for Register 2 (R2).
2	Register Tag 3	R/W	System	AC	10	0x20 → 0x7E for each byte	“Register3”	1.10	Text string used as a label for Register 3 (R3).
3	Register Tag 4	R/W	System	AC	10	0x20 → 0x7E for each byte	“Register4”	1.10	Text string used as a label for Register 4 (R4).
4	Register Tag 5	R/W	System	AC	10	0x20 → 0x7E for each byte	“Register5”	1.10	Text string used as a label for Register 5 (R5).
5	Register Tag 6	R/W	System	AC	10	0x20 → 0x7E for each byte	“Register6”	1.10	Text string used as a label for Register 6 (R6).
6	Register Tag 7	R/W	System	AC	10	0x20 → 0x7E for each byte	“Register7”	1.10	Text string used as a label for Register 7 (R7).
7	Register Tag 8	R/W	System	AC	10	0x20 → 0x7E for each byte	“Register8”	1.10	Text string used as a label for Register 8 (R8).
8	Register Tag 9	R/W	System	AC	10	0x20 → 0x7E for each byte	“Register9”	1.10	Text string used as a label for Register 9 (R9).
9	Register Tag 10	R/W	System	AC	10	0x20 → 0x7E for each byte	“Register10”	1.10	Text string used as a label for Register 10 (R10).

3.4.25 Point Type 98: Soft Point Parameters

Description: Point type 98 is the Soft Point Parameters for global storage that may be used by any part of the system.

Number of Logical Points: 32 logical points for Soft Point Parameters will exist.

Storage Location: Point type 98 will be saved to internal configuration memory.

Table 3-26: Point Type 98, Soft Point Parameters

Point Type 98: Soft Point Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	ASCII Text 1	R/W	User	AC	40	Any printable ASCII text.	“Soft Pt x”	1.10	Text string used to label instance of Soft Point. The ‘x’ in default is the number of the Soft Point.
1	Float 1	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
2	Float 2	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
3	Float 3	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
4	Float 4	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
5	Float 5	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
6	Float 6	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
7	Float 7	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
8	Float 8	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
9	Float 9	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
10	Float 10	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
11	Float 11	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
12	Float 12	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
13	Float 13	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
14	Float 14	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
15	Float 15	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
16	Float 16	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
17	Float 17	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
18	Float 18	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
19	Float 19	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
20	Float 20	R/W	User	FL	4	Any valid IEEE 754 float	0	1.10	Miscellaneous storage.
21	Long 1	R/W	User	UINT32	4	0 → 4294967295	0	1.10	Miscellaneous storage.

Point Type 98: Soft Point Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
22	Long 2	R/W	User	UINT32	4	0 → 4294967295	0	1.10	Miscellaneous storage.
23	Short 1	R/W	User	UINT16	2	0 → 65535	0	1.10	Miscellaneous storage.
24	Short 2	R/W	User	UINT16	2	0 → 65535	0	1.10	Miscellaneous storage.
25	Short 3	R/W	User	UINT16	2	0 → 65535	0	1.10	Miscellaneous storage.
26	Short 4	R/W	User	UINT16	2	0 → 65535	0	1.10	Miscellaneous storage.
27	Short 5	R/W	User	UINT16	2	0 → 65535	0	1.10	Miscellaneous storage.
28	Short 6	R/W	User	UINT16	2	0 → 65535	0	1.10	Miscellaneous storage.
29	Short 7	R/W	User	UINT16	2	0 → 65535	0	1.10	Miscellaneous storage.
30	Short 8	R/W	User	UINT16	2	0 → 65535	0	1.10	Miscellaneous storage.
31	Short 9	R/W	User	UINT16	2	0 → 65535	0	1.10	Miscellaneous storage.
32	Short 10	R/W	User	UINT16	2	0 → 65535	0	1.10	Miscellaneous storage.
33	Byte 1	R/W	User	UINT8	1	0 → 255	0	1.10	Miscellaneous storage.
34	Byte 2	R/W	User	UINT8	1	0 → 255	0	1.10	Miscellaneous storage.
35	Byte 3	R/W	User	UINT8	1	0 → 255	0	1.10	Miscellaneous storage.
36	Byte 4	R/W	User	UINT8	1	0 → 255	0	1.10	Miscellaneous storage.
37	Byte 5	R/W	User	UINT8	1	0 → 255	0	1.10	Miscellaneous storage.
38	Byte 6	R/W	User	UINT8	1	0 → 255	0	1.10	Miscellaneous storage.
39	Byte 7	R/W	User	UINT8	1	0 → 255	0	1.10	Miscellaneous storage.
40	Byte 8	R/W	User	UINT8	1	0 → 255	0	1.10	Miscellaneous storage.
41	Byte 9	R/W	User	UINT8	1	0 → 255	0	1.10	Miscellaneous storage.
42	Byte 10	R/W	User	UINT8	1	0 → 255	0	1.10	Miscellaneous storage.
43	Double 1	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	2.20	Miscellaneous storage.
44	Double 2	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	2.20	Miscellaneous storage.
45	Double 3	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	2.20	Miscellaneous storage.
46	Double 4	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	2.20	Miscellaneous storage.
47	Double 5	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	2.20	Miscellaneous storage.
48	Double 6	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	2.20	Miscellaneous storage.
49	Double 7	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	2.20	Miscellaneous storage.

Point Type 98: Soft Point Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
50	Double 8	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	2.20	Miscellaneous storage.
51	Double 9	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	2.20	Miscellaneous storage.
52	Double 10	R/W	User	Double	8	Valid IEEE double precision floating point	0.0	2.20	Miscellaneous storage.
53	Long 3	R/W	User	UINT32	4	0 → 4294967295	0	2.20	Miscellaneous storage.
54	Long 4	R/W	User	UINT32	4	0 → 4294967295	0	2.20	Miscellaneous storage.
55	Long 5	R/W	User	UINT32	4	0 → 4294967295	0	2.20	Miscellaneous storage.
56	Long 6	R/W	User	UINT32	4	0 → 4294967295	0	2.20	Miscellaneous storage.
57	Long 7	R/W	User	UINT32	4	0 → 4294967295	0	2.20	Miscellaneous storage.
58	Long 8	R/W	User	UINT32	4	0 → 4294967295	0	2.20	Miscellaneous storage.
59	Long 9	R/W	User	UINT32	4	0 → 4294967295	0	2.20	Miscellaneous storage.
60	Long 10	R/W	User	UINT32	4	0 → 4294967295	0	2.20	Miscellaneous storage.
61	Logging Enable	R/W	User	UINT8	1	0 → 1	1	2.20	Enables or disables event logging for changes to the soft point parameters on this logical. Valid values are 0 (logging disabled) and 1 (logging enabled).

3.4.26 Point Type 99: Configurable Opcode Table

Description: Point type 99 is the Configurable Opcode table that hosts may use to collect data from a ROC in a specific order.

There are 16 instances (logicals) of the Configurable Opcode table. Each instance of the Point Type is a grouping of up to 44 different ROC parameter definitions (Point **T**ype, **L**ogical Number, and **P**arameter Number, or TLP). Once you define the parameter(s), you can use opcodes 10 and 11 to read or write data from and to the TLPs identified by the Configurable Opcode Table.

Number of Logical Points: 16 logical points for Configurable Opcodes may exist.

Storage Location: Point type 99 is saved to internal configuration memory.

Note: The range of “Any valid TLP” indicates values represented as TLPs in the format 0,0,0, where (91-98 and 100-135), 0-xx (where the logical number corresponds to the last instance of the point type), 0-xx (where the parameter number corresponds to the number of parameters in the specified point type)

Table 3-27: Point Type 99, Configurable Opcode

Point Type 99: Configurable Opcode

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Sequence/Revision #	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Intended to be used for a revision number for this table.
1	Data 1	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
2	Data 2	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
3	Data 3	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
4	Data 4	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
5	Data 5	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
6	Data 6	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
7	Data 7	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
8	Data 8	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
9	Data 9	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
10	Data 10	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
11	Data 11	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
12	Data 12	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
13	Data 13	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
14	Data 14	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
15	Data 15	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
16	Data 16	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable

Point Type 99: Configurable Opcode

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
17	Data 17	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
18	Data 18	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
19	Data 19	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
20	Data 20	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
21	Data 21	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
22	Data 22	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
23	Data 23	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
24	Data 24	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
25	Data 25	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
26	Data 26	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
27	Data 27	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
28	Data 28	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
29	Data 29	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
30	Data 30	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
31	Data 31	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
32	Data 32	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
33	Data 33	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
34	Data 34	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
35	Data 35	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
36	Data 36	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
37	Data 37	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
38	Data 38	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
39	Data 39	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
40	Data 40	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
41	Data 41	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
42	Data 42	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
43	Data 43	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable
44	Data 44	R/W	User	TLP	3	Any valid TLP	0,0,0	1.10	User configurable

3.4.27 Point Type 100: Power Control Parameters

Description: Point type 100 provides the parameters to configuring radio power control.

Number of Logical Points: 6 logical points for Power Control Parameters may exist.

Storage Location: Point type 100 is saved to internal configuration memory.

Special Data Type

Name: HOURMINUTE
Length: 2 Bytes
Description:
This is supposed to be viewed as a time listed as a decimal-based number. The first two digits represent the hour and the last two digits represent the minute.
Range: 9999, 0 → 23 for 2 MS Digits; 0 → 59 for 2 LS Digits
Special Meanings: 9999, Disabled

Table 3-28: Point Type 100, Power Control Parameters

Point Type 100: Power Control Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Identification	R/W	User	AC	10	0x20 → 0x7E for each byte	LOI: "PWR_CTRL_0" COMM1: "PWR_CTRL_1" COMM2: "PWR_CTRL_2" COMM3: "PWR_CTRL_3" COMM4: "PWR_CTRL_4" COMM5: "PWR_CTRL_5"	1.10	The name used to identify this radio power control point.
1	Status	R/O	User	UINT8	1	0,1	0	1.10	Status of power control on this port. 0 = Power Disabled, 1 = Power Enabled
2	Enable	R/W	User	UINT8	1	0,1	0	1.10	The enabled mode for the power control on this port. 0 = Disabled, 1 = Enabled

Point Type 100: Power Control Parameters

3	Start Time #1	R/W	User	HOURMIN UTE	2	See Default Above	9999	1.10	Zone 1 start time.
4	Start Time #2	R/W	User	HOURMIN UTE	2	See Default Above	9999	1.10	Zone 2 start time.
5	Start Time #3	R/W	User	HOURMIN UTE	2	See Default Above	9999	1.10	Zone 3 start time.
6	On Time #1	R/W	User	UINT32	4	0, 100 → 4294967295	0	1.10	On time for Zone 1. The amount of time for this cycle, the DO associated with this power control will be in the on state (in milliseconds).
7	On Time #2	R/W	User	UINT32	4	0, 100 → 4294967295	0	1.10	On time for Zone 2. The amount of time for this cycle, the DO associated with this power control will be in the on state (in milliseconds).
8	On Time #3	R/W	User	UINT32	4	0, 100 → 4294967295	0	1.10	On time for Zone 3. The amount of time for this cycle, the DO associated with this power control will be in the on state (in milliseconds).
9	Off Time #1	R/W	User	UINT32	4	0, 100 → 4294967295	0	1.10	Off time for Zone 1. The amount of time (in milliseconds) for this cycle, the DO associated with this power control will be in the off state (following the on state)
10	Off Time #2	R/W	User	UINT32	4	0, 100 → 4294967295	0	1.10	Off time for Zone 2. The amount of time (in milliseconds) for this cycle, the DO associated with this power control will be in the off state (following the on state).
11	Off Time #3	R/W	User	UINT32	4	0, 100 → 4294967295	0	1.10	On time for Zone 3. The amount of time (in milliseconds) for this cycle, the DO associated with this power control will be in the off state (following the on state).
12	Active Time Zone	R/O	System	UINT8	1	1 → 3	1	1.10	This parameter is the current active power zone.
13	Hold Time	R/W	User	UINT32	4	0 → 4294967295	10000	1.10	Time in milliseconds that the output is held on after detection of communications. Not applicable for logical 1 if Ethernet Port.
14	Power Timer	R/O	System	UINT32	4	0 → 4294967295	0	1.10	Counts down the amount of time, in milliseconds, (On Time, Off Time, Hold Time) that the power control is currently using.
15	Discrete Output Number	R/W	User	TLP	3	[0,0,0] or Type: 102. Parameter: 8 Logical is 0→ (number of DO Points – 1).	0,0,0	1.10	The logical discrete output number.
16	Low Battery	R/W	User	FL	4	Any IEEE 754 floating point number.	11.0	1.10	The radio will not be turned on if the voltage drops below this value. In volts.
17	Cumulative On Time	R/W	Both	UINT32	4	0 → 4294967295	0	1.10	The counter shows how many seconds the radio power control has been on.

Point Type 100: Power Control Parameters

18	Cumulative Off Time	R/W	Both	UINT32	4	0 → 4294967295	0	1.10	This counter shows how many seconds the radio power control has been off.
19	Low Battery Deadband	R/W	User	FL	4	Any IEEE 754 floating point number.	1.0	1.10	This is a dead-band for the low battery level in power control. This is used to keep from the radio continuously turning on and off.

3.4.28 Point Type 101: Discrete Inputs

Description: Point type 101 provides parameters to set up and read discrete inputs.

Number of Logical Points: 8 logicals per inserted module exist.

Storage Location: Point type 101 is saved to internal configuration memory.

Table 3-29: Point Type 101, Discrete Inputs

Point Type 101: Discrete Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id.	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	“DI Default”	1.10	Identification name for specific DI. Values must be printable ASCII characters.
1	Scanning	R/W	User	UINT8	1	0 → 1	1	1.10	If disabled, field inputs are ignored and no changes will occur unless manually entered. 0 = Disabled, 1 = Enabled.
2	Filter	R/W	User	FL	4	0.00 → 43,200.0	0.3	1.10	Number of seconds that a DI must remain in the ON state before it is recognized as valid and the Status (parameter #3) is changed.
3	Status	R/W	Both	UINT8	1	0 → 1	0	1.10	Indicates what state the DI is currently in, ON (1) or OFF (0).
4	Invert Mode	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, the field input will be inverted in the Status (parameter #3 – ON becomes OFF and vice-versa). 0 = Invert Status Disabled, 1 = Invert Status Enabled.
5	Latch Mode	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, then, on an active transition of the input, the Status (parameter #3) will change to ON and remain in the ON state until it is cleared manually. 0 = Latch Status Disabled, 1 = Latch Status Enabled.
6	Accumulated Value	R/W	Both	UINT32	4	0 → 16,000,000	0	1.10	Number of times the Status (parameter #3) goes from OFF to ON. Value will rollover once it reaches the maximum range.
7	Cumulative On Time	R/W	Both	FL	4	0.0→ 1,000,000	0.0	1.10	Number of seconds when the Status (parameter #3) is in the ON state. Value will rollover once it reaches the maximum range.
8	Cumulative Off Time	R/W	Both	FL	4	0.0→ 1,000,000	0.0	1.10	Number of seconds when the Status (parameter #3) is in the OFF state. Value will rollover once it reaches the maximum range.
9	Alarming	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, alarms may be generated and sent to the Alarm Log. 0 = Disabled, 1 = Enabled.

Point Type 101: Discrete Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
10	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition clears. 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled.
11	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled.
12	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.10	
12.0	Not Used			Bit 0			0		Not Used
12.1	Not Used			Bit 1			0		Not Used
12.2	Not Used			Bit 2			0		Not Used
12.3	Not Used			Bit 3			0		Not Used
12.4	Not Used			Bit 4			0		Not Used
12.5	Status On Alarm			Bit 5			0	1.10	If set, the Status (parameter #3) is ON. If clear, the Status (parameter #3) is OFF.
12.6	Not Used			Bit 6			0		Not Used
12.7	Scanning Disabled Alarm			Bit 7			0	1.10	If set, the Scanning (parameter #1) has been disabled. If clear, the Scanning (parameter #1) has been enabled.
13	Scan Period	R/W	User	FL	4	0.004→43,200.0	0.05	1.10	Scan Period in Seconds
14	Actual Scan Time	R/O	System	FL	4	0.0 → 43,200.0	0.0	1.10	Actual number of seconds between updates of the DI.
15	Physical Status	R/O	System	UINT8	1	0 → 1	0	1.10	Indicates what state the hardware is currently in, ON (1) or OFF (0).

3.4.29 Point Type 102: Discrete Outputs

Description: Point type 102 is the Discrete Outputs parameters for setting up discrete outputs.

Number of Logical Points: 5 logical points for each installed DO or DO-Relay module. The DO-Relay 6 Point module has 6 logicals for each inserted module.

Storage Location: Point type 102 is saved to internal configuration memory.

Table 3-30: Point Type 102, Discrete Outputs

Point Type 102: Discrete Outputs

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id.	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"DO Default"	1.10	Identification name for specific DO. Values must be printable ASCII characters.
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"Percent "	1.10	Describes the units used by the DO. Values must be printable ASCII characters.
2	Scanning Mode	R/W	User	UINT8	1	0 → 2	1	1.10	If disabled, no changes to the output occur. If in Manual, only the user can change the values of the DO. If in Automatic, anything can change the values of the DO. 0 = Disabled, 1 = Automatic , 2 = Manual
3	Alarming	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, alarms may be generated and sent to the Alarm Log. 0 = Disabled, 1 = Enabled.
4	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition clears. 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled.
5	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled.
6	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.10	
6.0	Not Used			Bit 0			0		Not Used
6.1	Not Used			Bit 1			0		Not Used
6.2	Not Used			Bit 2			0		Not Used
6.3	Not Used			Bit 3			0		Not Used
6.4	Not Used			Bit 4			0		Not Used
6.5	Scanning Manual Alarm			Bit 5			0	1.10	If set, the Scanning (parameter #2) has been set to Manual. If clear, the Scanning (parameter #2) has been set to either Disable or Automatic
6.6	Not Used			Bit 6			0		Not Used

Point Type 102: Discrete Outputs

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6.7	Scanning Disabled Alarm			Bit 7			0	1.10	If set, the Scanning (parameter #2) has been disabled. If clear, the Scanning (parameter #2) has been set to either Automatic or Manual.
7	Failsafe on Reset	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, the Status (parameter #8) will be set to the status indicated in 'Failsafe Status Value' (Parameter #22) on a restart of any kind. If disabled, the last Status before the restart will be used. 0 = Output Last Status on Reset, 1 = Use Failsafe value on Reset.
8	Auto Output	R/W	Both	UINT8	1	0 → 1	0	1.10	Controls the state of the DO when Scanning (parameter #2) is in auto mode. In other words, the physical output gets this status when the mode (parameter # 2) is set to Automatic.
9	Accumulated Value	R/W	Both	UINT32	4	0 → 4,294,967,295	0	1.10	Number of times the Status (parameter #8) goes from OFF to ON.
10	Momentary Mode	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, the Status (parameter #8) will be turned ON for the entered Time On (parameter #14) and then be turned OFF. 0 = Momentary Disabled, 1 = Momentary Enabled.
11	Momentary Active	R/O	System	UINT8	1	0 → 1	0	1.10	Indicates that the DO currently has the Momentary ability active. 0 = Momentary Not Active, 1 = Momentary Active.
12	Toggle Mode	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, the Status (parameter #8) will be turned ON for the entered Time On (parameter #14) and then turned OFF for the same Time On. The Status will continue to cycle between the ON and OFF states. 0 = Toggle Disabled, 1 = Toggle Enabled.
13	Timed Discrete Output (TDO) Mode	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, the Status (parameter #8) will be turned ON for a calculated Time On (parameter #14) based upon the entered EU Value (parameter #20). After the Time On has expired, the Status will be turned OFF and remain that way until a new EU Value is entered. 0 = TDO Disabled, 1 = TDO Enabled.
14	Time On	R/W	Both	FL	4	DO: 0.002 → 43,200.0 DOR: 0.05→ 43,200.0	1.0	1.10	Number of seconds the Status (parameter #8) will be turned ON for if in TDO, Toggle, or Momentary Mode.

Point Type 102: Discrete Outputs

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
15	Cycle Time	R/W	User	FL	4	>0.0 → 43,200.0	15.0	1.10	Number of seconds for when TDO Mode (parameter #13) and Toggle Mode (parameter #12) are selected. The Status (parameter #8) will be ON for the calculated Time On (parameter #14) based upon the entered EU Value (parameter #20). The Status will then be turned OFF based upon the Cycle Time minus the Time On.
16	Low Reading Time	R/W	User	FL	4	0.0 → 43,200.0	3.0	1.10	Minimum number of seconds the calculated Time On (parameter #14) will be when the entered EU Value (parameter #20) is less than or equal to the entered Low Reading EU (parameter #18).
17	High Reading Time	R/W	User	FL	4	0.0 → 43,200.0	12.0	1.10	Maximum number of seconds the calculated Time On (parameter #14) will be when the entered EU Value (parameter #20) is greater than or equal to the entered High Reading EU (parameter #19).
18	Low Reading EU	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Minimum EU Value (parameter #20) possible.
19	High Reading EU	R/W	User	FL	4	Any valid IEEE 754 float	100.0	1.10	Maximum EU Value (parameter #20) possible.
20	EU Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Value in Engineering Units.
21	Manual Output	R/W	Both	UINT8	1	0 → 1	0	1.10	Controls the state of the DO when Scanning (parameter #2) is in manual mode. In other words, the physical output gets this status when the mode (parameter # 2) is set to Manual.
22	Failsafe Output	R/W	User	UINT8	1	0 → 1	1	1.10	The state the output will be placed in when the unit is started and the Failsafe on Reset Parameter (Parameter 7) is set to 1, Use Failsafe value on reset.
23	RESERVED								Reserved fof future use
24	Physical Output	R/O	System	UINT8	1	0 → 1	0	1.10	Indicates what state the DO is currently in, ON (1) or OFF (0).
25	Invert Output Mode	R/W	User	UINT8	1	0 → 1	0	2.20	Inverts the output of the ACIO channel. This allows you to use TDO mode to keep a channel OFF for a set amount of time and then bring the channel back ON. Valid values are 0 (Normal) and 1 (Inverted). **Note**: This always inverts the output, including the Failsafe Output.
26	DO Type	R/O	System	UINT8	1	0 → 1	0	2.20	Indicates the type of DO (relay or solid state). Valid values are: 0 = DO Relay 1 = DO Solid State 3 = DO Relay 6 Point

3.4.30 Point Type 103: Analog Inputs

Description: Point type 103 is the Analog Inputs parameters for setting up and reading analog inputs.

Number of Logical Points: 4 logical points for each installed AI module.

Storage Location: Point type 103 is saved to internal configuration memory.

Table 3-31: Point Type 103, Analog Inputs

Point Type 103: Analog Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id.	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"AI Default"	1.10	Identification name for specific AI. Values must be printable ASCII characters.
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	" "	1.10	Describes the units used by the AI. Values must be printable ASCII characters.
2	Scanning	R/W_CNDL	User	UINT8	1	0 → 1	1	1.10	If disabled, field inputs are ignored and no changes will occur unless manually entered. 0 = Disabled, 1 = Enabled.
3	Scan Period	R/W_CNDL	User	FL	4	0.05 → 43,200.0	1.0	1.10	Number of seconds between updates of the AI.
4	Actual Scan Time	R/O	System	FL	4	0.0 → 43,200.0	0.0	1.10	Actual number of seconds between updates of the AI.
5	Filter	R/W_CNDL	User	UINT8	1	0 → 99	3	1.10	Percentage of last raw A/D reading to be weighted with the new raw A/D reading.
6	Averaging	R/W_CNDL	User	UINT8	1	0 → 1	0	1.10	If enabled, the filtered raw A/D value is averaged over the Scan Period. If disabled, the current filtered raw A/D value is used when the Scan Period is reached. 0 = Disabled, 1 = Enabled.
7	Raw A/D Input	R/W_CNDL	Both	UINT16	2	0 → 65,535	0	1.10	Raw A/D reading used to calculate the EU Value (parameter #21).
8	Zero Raw	R/W_CNDL	User	UINT16	2	0 → 65,535	AI-12:819 AI16: 13,107	1.10	Lowest calibrated raw A/D input.
9	Mid Point Raw #1	R/W_CNDL	User	UINT16	2	0 → 65,535	AI-12: 4,095 AI16: 65,535	1.10	Second lowest calibrated raw A/D input.
10	Mid Point Raw #2	R/W_CNDL	User	UINT16	2	0 → 65,535	AI-12: 4,095 AI16: 65,535	1.10	Third lowest or highest calibrated raw A/D input.

Point Type 103: Analog Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
11	Mid Point Raw #3	R/W_CNDL	User	UINT16	2	0 → 65,535	AI-12: 4,095 AI16: 65,535	1.10	Second highest calibrated raw A/D input.
12	Span Raw	R/W_CNDL	User	UINT16	2	0 → 65,535	AI-12: 4,095 AI16: 65,535	1.10	Highest calibrated raw A/D input.
13	Zero EU	R/W_CNDL	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Lowest calibrated EU value.
14	Mid Point EU #1	R/W_CNDL	User	FL	4	Any valid IEEE 754 float	100.0	1.10	Second lowest calibrated EU value.
15	Mid Point EU #2	R/W_CNDL	User	FL	4	Any valid IEEE 754 float	100.0	1.10	Third lowest or highest calibrated EU value.
16	Mid Point EU #3	R/W_CNDL	User	FL	4	Any valid IEEE 754 float	100.0	1.10	Second highest calibrated EU value.
17	Span EU	R/W_CNDL	User	FL	4	Any valid IEEE 754 float	100.0	1.10	Highest calibrated EU value. When this parameter changes, Parameters 14,15,16 are set equal to this value.
18	Offset (Zero Shift)	R/W_CNDL	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Value to be added to all calculated EU values.
19	Set Value	R/W_CNDL	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Desired EU value for a calibration point. **Note**: No event is logged for this parameter
20	Manual Value	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.10	Current EU Value of AI while performing calibration.
21	EU Value	R/W_CNDL	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Value in Engineering Units.
22	Clipping	R/W_CNDL	User	UINT8	1	0 → 1	0	1.10	If enabled, then the EU Value (parameter #21) cannot be less than the Low Low Alarm EU (parameter #23) or greater than the High High Alarm EU (parameter #26). If disabled, no limiting of the EU Value (parameter #21) takes place. 0 = Disabled, 1 = Enabled.
23	Low Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-20.0	1.10	Alarm value for Low Low Alarm and minimum EU Value (parameter #21) if Clipping (parameter #22) is enabled.
24	Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-10.0	1.10	Alarm value for Low Alarm.
25	High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	110.0	1.10	Alarm value for High Alarm.
26	High High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	120.0	1.10	Alarm value for High High Alarm and maximum EU Value (parameter #21) if Clipping (parameter #22) is enabled.
27	Rate Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	5.0	1.10	Alarm value for maximum change of EU Value (parameter #21) between Scan Periods.
28	Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.10	Provides a range (±) that the EU Value (parameter #21) may move between without causing another alarm.

Point Type 103: Analog Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
29	Alarming	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, alarms may be generated and sent to the Alarm Log. 0 = Disabled, 1 = Enabled.
30	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition clears. 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled.
31	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled.
32	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.10	
32.0	Low Alarm			Bit 0			0	1.10	If set, the EU Value (parameter #21) is less than or equal to the Low Alarm EU (parameter #24). If clear, the EU Value (parameter #21) is greater than the Low Alarm EU (parameter #24).
32.1	Low Low Alarm			Bit 1			0	1.10	If set, the EU Value (parameter #21) is less than or equal to the Low Low Alarm EU (parameter #23). If clear, the EU Value (parameter #21) is greater than the Low Low Alarm EU (parameter #23).
32.2	High Alarm			Bit 2			0	1.10	If set, the EU Value (parameter #21) is greater than or equal to the High Alarm EU (parameter #25). If clear, the EU Value (parameter #21) is less than the High Alarm EU (parameter #25).
32.3	High High Alarm			Bit 3			0	1.10	If set, the EU Value (parameter #21) is greater than or equal to the High High Alarm EU (parameter #26). If clear, the EU Value (parameter #21) is less than the High High Alarm EU (parameter #26).
32.4	Rate Alarm			Bit 4			0	1.10	If set, the EU Value (parameter #21) change from last Scan Period to the new Scan Period is greater than or equal to the Rate Alarm EU (parameter #27). If clear, the EU Value (parameter #21) change from last Scan Period to the new Scan Period is less than the Rate Alarm EU (parameter #27).
32.5	Not Used			Bit 5			0		Not Used
32.6	Point Fail Alarm			Bit 6			0	1.10	If set, the AI's hardware is reporting a malfunction. If clear, the AI's hardware is operating properly.
32.7	Scanning Disabled Alarm			Bit 7			0	1.10	If set, the Scanning (parameter #2) has been disabled. If clear, the Scanning (parameter #2) has been enabled.
33	Calibration Timer	R/O	System	FL	4	0.0 → 3,600.0	3,600.0	1.10	Number of seconds until a calibration timeout occurs.

Point Type 103: Analog Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
34	Calibration Mode	R/W_CNDL	Both	UINT8	1	$0 \rightarrow 4$	0	1.10	Indicates what the calibration for the AI is doing. 0 = Use Current Calibration, 1 = Start Calibration, 2 = Calibrate, 3 = Restore Previous Calibration, 4 = Stop Calibration. **Note**: No event is logged for this parameter.
35	Calibration Type	R/W_CNDL	Both	UINT8	1	$0 \rightarrow 6$	0	1.10	During calibration, determines what the Set Value (parameter #19) is replacing. 0 = Nothing, 1 = Set Zero, 2 = Set Span, 3 = Set Mid Point #1, 4 = Set Mid Point #2, 5 = Set Mid Point #3, 6 = Set Offset (Zero Shift). **Note**: No event is logged for this parameter.
36	Failsafe Mode	R/W	User	UINT8	1	$0 \rightarrow 1$	0	2.30	Valid alues are 0 (Disabled) and 1 (Enabled, the EU Value is set to the Failsafe Value in the event of a point fail).
37	Failsafe Value	R/W	User	FL	4	Any valid IEEE 754 float	0	2.20	The AI's EU Value is set to the Failsafe Value if Failsafe Mode is enabled and the AI is in point fail.
38	AI Type	R/O	System	UINT8	1	$0 \rightarrow 1$	0	2.20	Indicates the type of AI module (12- or 16-bit). Valid values are 0 (AI 12-bit) and 1 (AI 16-bit).
39	Equivalent Milliamp Value	R/O	System	FL	4	$4 \rightarrow 20$	0	2.20	Output of module scaled to a 4-20 value to be equivalent to milliamps.

3.4.31 Point Type 104: Analog Outputs

Description: Point type 104 provides the parameters for setting up analog outputs.

Number of Logical Points: 4 logical points for each installed AO module.

Storage Location: Point type 104 is saved to internal configuration memory.

Table 3-32: Point Type 104, Analog Outputs

Point Type 104: Analog Outputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id.	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"AO Default"	1.10	Identification name for specific AO. Values must be printable ASCII characters.
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"Percent "	1.10	Describes the units used by the AO. Values must be printable ASCII characters.
2	Scanning Mode	R/W	User	UINT8	1	0 → 2	1	1.10	If disabled, no changes to the output will occur. If in Manual, only the user can change the values of the AO. If in Automatic, anything can change the values of the AO. 0 = Disabled, 1 = Automatic , 2 = Manual
3	Alarming	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, alarms may be generated and sent to the Alarm Log. 0 = Disabled, 1 = Enabled.
4	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition clears. 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled.
5	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled.
6	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.10	
6.0	Not Used			Bit 0			0		Not Used
6.1	Not Used			Bit 1			0		Not Used
6.2	Not Used			Bit 2			0		Not Used
6.3	Not Used			Bit 3			0		Not Used
6.4	Not Used			Bit 4			0		Not Used
6.5	Scanning Manual Alarm			Bit 5			0	1.10	If set, the Scanning (parameter #2) has been set to Manual. If clear, the Scanning (parameter #2) has been set to either Disable or Automatic

Point Type 104: Analog Outputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6.6	Point Fail Alarm			Bit 6			0	1.10	If set, the AO's hardware is reporting a malfunction. If clear, the AO's hardware is operating properly.
6.7	Scanning Disabled Alarm			Bit 7			0	1.10	If set, the Scanning (parameter #2) has been disabled. If clear, the Scanning (parameter #2) has been set to Manual or Automatic.
7	Failsafe on Reset	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, the Raw D/A Output (parameter #13) will be set to the Failsafe value (parameter #22) on a restart of any kind. If disabled, the last EU Value (parameter #13) or the last saved EU Value will be used to determine the Raw D/A Output (parameter #13) after a restart. 0 = Use last EU Value on reset, 1 = Use Failsafe value on Reset.
8	Zero Raw	R/W	User	UINT16	2	0 → 65,535	12,584	1.10	Minimum D/A count the calculated Raw D/A Output (parameter #13) will be when the entered EU Value (parameter #12) is less than or equal to the entered Zero EU (parameter #10).
9	Span Raw	R/W	User	UINT16	2	0 → 65,535	62,923	1.10	Maximum D/A count the calculated Raw D/A Output (parameter #13) will be when the entered EU Value (parameter #12) is greater than or equal to the entered Span EU (parameter #11).
10	Zero EU	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Minimum EU Value (parameter #12) possible.
11	Span EU	R/W	User	FL	4	Any valid IEEE 754 float	100.0	1.10	Maximum EU Value (parameter #12) possible.
12	Auto Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Controls the output when Scanning (parameter #2) is in auto mode.
13	Raw D/A Output	R/O	System	UINT16	2	0 → 65,535	12,584	1.10	Calculated Digital-to-Analog value based upon EU Value (parameter #12).
14	Manual Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Controls the output when Scanning (parameter #2) is in manual mode.
15	Failsafe Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	This is the value that will be outputted when the unit is started and the Failsafe on Reset Parameter (Parameter 7) is set to 1, Use Failsafe value on reset.
16	Physical Value	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.10	Indicates the current value of the output in Engineering Units.

3.4.32 Point Type 105: Pulse Inputs

Description: Point type 105 provides parameters for setting up and reading pulse inputs.

Number of Logical Points: 4 logical points for each installed module.

Storage Location: Point type 105 is saved to internal configuration memory.

Table 3-33: Point Type 105, Pulse Inputs

Point Type 105: Pulse Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id.	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"PI Default"	1.10	Identification name for specific PI. Values must be printable ASCII characters.
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	" "	1.10	Describes the units used by the PI. Values must be printable ASCII characters.
2	Scanning	R/W_CNDL	User	UINT8	1	0 → 1	1	1.10	If disabled, field inputs are ignored and no changes will occur unless manually entered. 0 = Disabled, 1 = Enabled.
3	Scan Period	R/W_CNDL	User	FL	4	0.05 → 43,200.0	1.0	1.10	Number of seconds between updates of the PI.
4	Accumulated Value	R/O	System	UINT32	4	0→16,000,000	0	1.10	Total number of pulses that the PI has received.
5	Contract Hour	R/W_CNDL	User	UINT8	1	0 → 23	0	1.10	Hour, in military time, that represents the end of the day for the PI.
6	Pulses for Day	R/O	Both	UINT32	4	0 → 4,294,967,295	0	1.10	Total number of pulses that the PI has received for the contract day.
7	Current Rate Period	R/W_CNDL	User	UINT8	1	0 → 3	2	1.10	Used to determine the calculation of the Current Rate (parameter #10). 0 = EU/second, 1 = EU/minute, 2 = EU/hour, 3 = EU/day.
8	Conversion	R/W_CNDL	User	UINT8	1	0 → 1	1	1.10	Determines if Conversion Value (parameter #9) will be multiplied or divided by the accumulated pulses to determine the units for the Current Rate (parameter #10). 0 = EUs/pulse, 1 = pulses/EU.
9	Conversion Value	R/W_CNDL	User	FL	4	Any valid IEEE 754 float, except 0.0	1.0	1.10	Used to calculate the units of the Current Rate (parameter #10).
10	Current Rate	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.10	Calculated rate of the pulses.
11	EU Value Mode	R/W_CNDL	User	UINT8	1	0 → 2	0	1.10	Used to determine what the EU Value (parameter #13) will represent. 0 = Rate, 1 = Accumulator with Maximum Rollover, 2 = Accumulator with Entered Rollover.

Point Type 105: Pulse Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	Rollover Maximum	R/W_CNDL	User	FL	4	Any valid IEEE 754 float	1,000.0	1.10	This is the Entered Rollover Maximum for the EU Value Mode (parameter #11) when it is setup for Accumulator with Entered Rollover.
13	EU Value	R/W_CNDL	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Value in Engineering Units.
14	Low Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Alarm value for Low Low Alarm when the EU Value Mode (parameter #11) is setup for Rate.
15	Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	10.0	1.10	Alarm value for Low Alarm when the EU Value Mode (parameter #11) is setup for Rate.
16	High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	100.0	1.10	Alarm value for High Alarm when the EU Value Mode (parameter #11) is setup for Rate.
17	High High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	110.0	1.10	Alarm value for High High Alarm when the EU Value Mode (parameter #11) is setup for Rate.
18	Rate Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	5.0	1.10	Alarm value for maximum change of EU Value (parameter #13) between Scan Periods when the EU Value Mode (parameter #11) is setup for Rate.
19	Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.10	Provides a range (±) that the EU Value (parameter #13) may move between without causing another alarm when the EU Value Mode (parameter #11) is setup for Rate.
20	Alarming	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.10	If enabled, alarms may be generated and sent to the Alarm Log. 0 = Disabled, 1 = Enabled.
21	SRBX on Clear	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.10	Indicates a SRBX alarm is desired if an alarm condition clears. 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled.
22	SRBX on Set	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.10	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled.
23	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.10	
23.0	Low Alarm			Bit 0			0	1.10	If set, the EU Value (parameter #13) is less than or equal to the Low Alarm EU (parameter #15). If clear, the EU Value (parameter #13) is greater than the Low Alarm EU (parameter #15).
23.1	Low Low Alarm			Bit 1			0	1.10	If set, the EU Value (parameter #13) is less than or equal to the Low Low Alarm EU (parameter #14). If clear, the EU Value (parameter #13) is greater than the Low Low Alarm EU (parameter #14).

Point Type 105: Pulse Inputs

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
23.2	High Alarm			Bit 2			0	1.10	If set, the EU Value (parameter #13) is greater than or equal to the High Alarm EU (parameter #16). If clear, the EU Value (parameter #13) is less than the High Alarm EU (parameter #16).
23.3	High High Alarm			Bit 3			0	1.10	If set, the EU Value (parameter #13) is greater than or equal to the High High Alarm EU (parameter #17). If clear, the EU Value (parameter #13) is less than the High High Alarm EU (parameter #17).
23.4	Rate Alarm			Bit 4			0	1.10	If set, the EU Value (parameter #13) change from last Scan Period to the new Scan Period is greater than or equal to the Rate Alarm EU (parameter #18). If clear, the EU Value (parameter #13) change from last Scan Period to the new Scan Period is less than the Rate Alarm EU (parameter #18).
23.5	Not Used			Bit 5			0		Not Used
23.6	Point Fail Alarm			Bit 6			0	1.10	If set, the PI’s hardware is reporting a malfunction. If clear, the PI’s hardware is operating properly.
23.7	Scanning Disabled Alarm			Bit 7			0	1.10	If set, the Scanning (parameter #2) has been disabled. If clear, the Scanning (parameter #2) has been enabled.
24	Today’s Total	R/O	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Calculated value of the accumulated pulses for the contract day multiplied by the Conversion Value (parameter #9).
25	Yesterday’s Total	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.10	Previous contract day’s total.
26	Corrected Pulse Accumulation	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.10	Running accumulation of Pulses * X. Where X is = Conversion Value when Parameter 8 is set to EU/Pulse or X is set to 1/Conversion Value if Pulses/EU. Rolls over at 1,000,000.0
27	Frequency	R/W_CNDL	System	FL	4	0 → positive valid IEEE 754 float	0.0	1.10	Frequency of incoming pulses in pulses/second.

3.4.33 Point Type 106: RTD

Description: Point type 106 provides parameters for setting up and reading a RTD.

Number of Logical Points: 2 logical points for each installed RTD module. 3 logicals per installed module exist for the RTD 3-Point module.

Storage Location: Point type 106 is saved to internal configuration memory.

Table 3-34: Point Type 106, RTD

Point Type 106: RTD

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id.	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"RTD Deflt "	1.10	Identification name for specific RTD. Values must be printable ASCII characters.
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	" "	1.10	Describes the units used by the RTD. Values must be printable ASCII characters.
2	Scanning	R/W_CNDL	User	UINT8	1	0 → 1	1	1.10	If disabled, field inputs are ignored and no changes will occur unless manually entered. 0 = Disabled, 1 = Enabled.
3	Scan Period	R/W_CNDL	User	FL	4	0.066 → 43,200.0	1.0	1.10	Number of seconds between updates of the RTD.
4	Actual Scan Time	R/O	System	FL	4	0.05 → 43,200.0	0.0	1.10	Actual number of seconds between updates of the RTD.
5	Filter	R/W_CNDL	User	UINT8	1	0 → 99	3	1.10	Percentage of last raw A/D reading to be weighted with the new raw A/D reading.
6	Averaging	R/W_CNDL	User	UINT8	1	0 → 1	0	1.10	If enabled, the filtered raw A/D value is averaged over the Scan Period. If disabled, the current filtered raw A/D value is used when the Scan Period is reached. 0 = Disabled, 1 = Enabled.
7	Alpha of RTD	R/W_CNDL	User	UINT8	1	0 → 1	0	1.10	Indicates what the alpha (α) of the RTD. 0 = Alpha of 0.00385, 1 = Alpha of 0.00392.
8	Raw A/D Input	R/W_CNDL	Both	UINT16	2	0 → 65,535	0	1.10	Raw A/D reading used to calculate the EU Value (parameter #22).
9	Zero Raw	R/O	User	UINT16	2	0 → 65,535	42973	1.10	Lowest calibrated raw A/D input.
10	Mid Point Raw #1	R/O	User	UINT16	2	0 → 65,535	61963	1.10	Second lowest calibrated raw A/D input.
11	Mid Point Raw #2	R/O	User	UINT16	2	0 → 65,535	61963	1.10	Third lowest or highest calibrated raw A/D input.
12	Mid Point Raw #3	R/O	User	UINT16	2	0 → 65,535	61963	1.10	Second highest calibrated raw A/D input.
13	Span Raw	R/O	User	UINT16	2	0 → 65,535	61963	1.10	Highest calibrated raw A/D input.
14	Zero EU	R/O	User	FL	4	Any valid IEEE 754 float	-50.0	1.10	Lowest calibrated EU value.

Point Type 106: RTD

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
15	Mid Point EU #1	R/O	User	FL	4	Any valid IEEE 754 float	350.0	1.10	Second lowest calibrated EU value.
16	Mid Point EU #2	R/O	User	FL	4	Any valid IEEE 754 float	350.0	1.10	Third lowest or highest calibrated EU value.
17	Mid Point EU #3	R/O	User	FL	4	Any valid IEEE 754 float	350.0	1.10	Second highest calibrated EU value.
18	Span EU	R/O	User	FL	4	Any valid IEEE 754 float	350.0	1.10	Highest calibrated EU value.
19	Reserved	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.10	Unused parameter
20	Set Value	R/W_CNDL	User	FL	4	Any valid IEEE 754 float	-50→350 °C -58→662 °F 401.67→ 1121.67 R 223.15→ 623.15 K 80.31→ 229.72 Ω (385) 80→ 231.89 Ω (392)	1.10	Desired EU value for a calibration point. **Note**: No event is logged for this parameter. The range is based upon the unit selected.
21	Manual Value	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.10	Current EU Value of RTD while performing calibration.
22	EU Value	R/W_CNDL	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Value in Engineering Units.
23	Clipping	R/W_CNDL	User	UINT8	1	0 → 1	0	1.10	If enabled, then the EU Value (parameter #22) cannot be less than the Low Low Alarm EU (parameter #24) or greater than the High High Alarm EU (parameter #27). If disabled, no limiting of the EU Value (parameter #22) takes place. 0 = Disabled, 1 = Enabled.
24	Low Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-20.0	1.10	Alarm value for Low Low Alarm and minimum EU Value (parameter #22) if Clipping (parameter #23) is enabled.
25	Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-10.0	1.10	Alarm value for Low Alarm.
26	High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	110.0	1.10	Alarm value for High Alarm.
27	High High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	120.0	1.10	Alarm value for High High Alarm and maximum EU Value (parameter #22) if Clipping (parameter #23) is enabled.
28	Rate Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	5.0	1.10	Alarm value for maximum change of EU Value (parameter #22) between Scan Periods.
29	Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.10	Provides a range (±) that the EU Value (parameter #22) may move between without causing another alarm.

Point Type 106: RTD

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
30	Alarming	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, alarms may be generated and sent to the Alarm Log. 0 = Disabled, 1 = Enabled.
31	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition clears. 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled.
32	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled.
33	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.10	
33.0	Low Alarm			Bit 0			0	1.10	If set, the EU Value (parameter #22) is less than or equal to the Low Alarm EU (parameter #25). If clear, the EU Value (parameter #22) is greater than the Low Alarm EU (parameter #25).
33.1	Low Low Alarm			Bit 1			0	1.10	If set, the EU Value (parameter #22) is less than or equal to the Low Low Alarm EU (parameter #24). If clear, the EU Value (parameter #22) is greater than the Low Low Alarm EU (parameter #24).
33.2	High Alarm			Bit 2			0	1.10	If set, the EU Value (parameter #22) is greater than or equal to the High Alarm EU (parameter #26). If clear, the EU Value (parameter #22) is less than the High Alarm EU (parameter #26).
33.3	High High Alarm			Bit 3			0	1.10	If set, the EU Value (parameter #22) is greater than or equal to the High High Alarm EU (parameter #27). If clear, the EU Value (parameter #22) is less than the High High Alarm EU (parameter #27).
33.4	Rate Alarm			Bit 4			0	1.10	If set, the EU Value (parameter #22) change from last Scan Period to the new Scan Period is greater than or equal to the Rate Alarm EU (parameter #28). If clear, the EU Value (parameter #22) change from last Scan Period to the new Scan Period is less than the Rate Alarm EU (parameter #28).
33.5	Not Used			Bit 5			0		Not Used
33.6	Point Fail Alarm			Bit 6			0	1.10	If set, the RTD's hardware is reporting a malfunction. If clear, the RTD's hardware is operating properly.
33.7	Scanning Disabled Alarm			Bit 7			0	1.10	If set, the Scanning (parameter #2) has been disabled. If clear, the Scanning (parameter #2) has been disabled.

Point Type 106: RTD

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
34	Calibration Timer	R/O	System	FL	4	0.0 → 3,600.0	3,600.0	1.10	Number of seconds until a calibration timeout occurs.
35	Calibration Mode	R/W_CNDL	Both	UINT8	1	0 → 4	0	1.10	Describes what the calibration for the RTD is doing. Valid values are: 0 = Use Current Calibration 1 = Start Calibration 2 = Calibrate 3 = Restore Previous Calibration 4 = Stop Calibration.
36	Calibration Type	R/W_CNDL	Both	UINT8	1	0 → 6	0	1.10	During calibration, determines what the Set Value (parameter #20) replaces. Valid values are: 0 = Nothing 1 = Set Zero 2 = Set Span 3 = Set Mid Point #1 4 = Set Mid Point #2 5 = Set Mid Point #3 6 = Unused. **Note**: No event is logged for this parameter
37	Units	R/W_CNDL	User	UINT8	1	0 → 4	0	1.20	Indicates the units for the point. Valid values are: 0 = °F 1 = °C 2 = °K 3 = °R 4 = Ohms. **Note**: Version 1.20 changed the default from 1 (°C) to 0 (°F)

3.4.34 Point Type 107: Thermocouple

Description: Point type 107 provides parameters for setting up and reading a thermocouple.

Number of Logical Points: 5 logical points for each installed 5-point T/C module (labeled **T/C**); 4 logical points for each 4-point TC module (labled **4 T/C**)

Storage Location: Point type 107 is saved to internal configuration memory.

Table 3-35: Point Type 107, Thermocouple

Point Type 107: Thermocouple

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id.	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"TC Default"	1.10	Identification name for specific TC. Values must be printable ASCII characters.
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	" "	1.10	Describes the units used by the TC. Values must be printable ASCII characters.
2	Scanning	R/W	User	UINT8	1	0 → 1	1	1.10	If disabled, field inputs are ignored and no changes will occur unless manually entered. 0 = Disabled, 1 = Enabled.
3	Units	R/W	User	UINT8	1	0 → 3	0	1.20	Indicates the TC units. Valid values are: 0 = °F 1 = °C 2 = °K 3 = °R **Note**: Version 1.20 changed the default from 1 (°C) to 0 (°F).
4	Type of Thermocouple	R/W	System	UINT8	1	0 → 8	0	1.10	Indicates the type opf thermocouple. Valid values are: 0 = Type J 1 = Type K 2 = Type B 3 = Type E 4 = Type R 5 = Type S 6 = Type T 7 = Type C 8 = Type N **Note**: **Only** types J and K (values 1 and 2) are available on the original 5-point TC module.
5	Scan Period	R/W	User	FL	4	0.1 → 43,200.0	1.0	1.10	Number of seconds between updates of the TC.

Point Type 107: Thermocouple

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6	Actual Scan Time	R/O	System	FL	4	0.00 → 43,200.0	0.0	1.10	Actual number of seconds between updates of the TC.
7	Filter	R/W	User	UINT8	1	0 → 99	0	1.10	Percentage of last raw A/D reading to be weighted with the new raw A/D reading.
8	Averaging	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, the filtered EU value is averaged over the Scan Period. If disabled, the current filtered EU value is used when the Scan Period is reached. 0 = Disabled, 1 = Enabled.
9	EU Value	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Value in Engineering Units.
10	Low Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-20.0	1.10	Alarm value for Low Low Alarm and minimum EU Value (parameter #22) if Clipping (parameter #23) is enabled.
11	Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-10.0	1.10	Alarm value for Low Alarm.
12	High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	110.0	1.10	Alarm value for High Alarm.
13	High High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	120.0	1.10	Alarm value for High High Alarm and maximum EU Value (parameter #22) if Clipping (parameter #23) is enabled.
14	Rate Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	5.0	1.10	Alarm value for maximum change of EU Value (parameter #22) between Scan Periods.
15	Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.10	Provides a range (±) that the EU Value (parameter #22) may move between without causing another alarm.
16	Alarming	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, alarms may be generated and sent to the Alarm Log. 0 = Disabled, 1 = Enabled.
17	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition clears. 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled.
18	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled.
19	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.10	
19.0	Low Alarm			Bit 0			0	1.10	If set, the EU Value (parameter #22) is less than or equal to the Low Alarm EU (parameter #25). If clear, the EU Value (parameter #22) is greater than the Low Alarm EU (parameter #25).
19.1	Low Low Alarm			Bit 1			0	1.10	If set, the EU Value (parameter #22) is less than or equal to the Low Low Alarm EU (parameter #24). If clear, the EU Value (parameter #22) is greater than the Low Low Alarm EU (parameter #24).

Point Type 107: Thermocouple

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
19.2	High Alarm			Bit 2			0	1.10	If set, the EU Value (parameter #22) is greater than or equal to the High Alarm EU (parameter #26). If clear, the EU Value (parameter #22) is less than the High Alarm EU (parameter #26).
19.3	High High Alarm			Bit 3			0	1.10	If set, the EU Value (parameter #22) is greater than or equal to the High High Alarm EU (parameter #27). If clear, the EU Value (parameter #22) is less than the High High Alarm EU (parameter #27).
19.4	Rate Alarm			Bit 4			0	1.10	If set, the EU Value (parameter #22) change from last Scan Period to the new Scan Period is greater than or equal to the Rate Alarm EU (parameter #28). If clear, the EU Value (parameter #22) change from last Scan Period to the new Scan Period is less than the Rate Alarm EU (parameter #28).
19.5	Not Used			Bit 5			0		Not Used
19.6	Point Fail Alarm			Bit 6			0	1.10	If set, the TC’s hardware is reporting a malfunction. If clear, the TC’s hardware is operating properly.
19.7	Scanning Disabled Alarm			Bit 7			0	1.10	If set, the Scanning (parameter #2) has been disabled. If clear, the Scanning (parameter #2) has been disabled.
20	EU Offset	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Value to be added to EU value (parameter #9).

3.4.35 Point Type 108: Multi-Variable Sensor

Description: Point type 108 provides parameters for interfacing with an MVS.

Number of Logical Points: 6 logical points for each installed module.

Storage Location: Point type 108 is saved to internal configuration memory.

Table 3-36: Point Type 108, Multi-Variable Sensor

Point Type 108: Multi-Variable Sensor

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Sensor Tag Id.	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"MVS Deflt "	1.10	Identification name for specific MVS. Values must be printable ASCII characters.
1	Sensor Address	R/W	User	UINT8	1	0 → 255	1	1.10	Unique address of MVS to allow for multi-drop communications.
2	Poll Mode	R/W	Both	UINT8	1	0 → 2, 4 → 5	0	1.10	Sets the operation for the MVS Module. 0 = Off Scan Mode, 1 = Normal Poll Mode, 2 = Input Freeze Mode, 4 = Configuration Poll Mode, 5 = Set Tag and Address Mode.
3	Units	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates what engineering units the process variables will be. 0 = English Units, 1 = Metric Units.
4	Inches H_2O	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates the reference temperature for calculating pressure properly. 0 = Inches H_2O at 60 °F, 1 = Inches H_2O at 68 °F.
5	Pressure Tap Location	R/W	User	UINT8	1	0 → 1	1	1.10	Indicates if the static pressure is an upstream or downstream reading. 0 = Downstream, 1 = Upstream.
6	Action on Failure	R/W	User	UINT8	1	0 → 1	1	1.10	Indicates whether the DP Reading, SP Reading, TMP Reading, and DP Reverse Reading should retain last value or be set to the Fault Value parameters when a 485 or Sensor Communication Failure occurs. 0 = Retain Last Value, 1 = Use Fault Value parameters.
7	Software Revision MVS Interface	R/O	System	UINT8	1	0 → 255	0	1.10	Current software revision of the MVS Interface software.
8	Sensor Voltage	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.10	Current voltage of MVS in volts.
9	Sensor Alarming	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, alarms may be generated and sent to the Alarm Log. 0 = Disabled, 1 = Enabled.
10	Sensor Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.10	

Point Type 108: Multi-Variable Sensor

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
10.0	Not Used			Bit 0			0		Not Used
10.1	Not Used			Bit 1			0		Not Used
10.2	Not Used			Bit 2			0		Not Used
10.3	Not Used			Bit 3			0		Not Used
10.4	Input Freeze Mode			Bit 4			0	1.10	Indicates the Poll Mode (parameter #2) is in Input Freeze Mode. 0 = Not in Input Freeze Mode, 1 = Input Freeze Mode.
10.5	Sensor Communication Failure			Bit 5			0	1.10	Indicates the MVS is no longer communicating with the MVS Interface. 0 = No Failure, 1 = Sensor Communication Failure.
10.6	485 Communication Failure			Bit 6			0	1.10	Indicates the MVS Interface is no longer communicating with the ROC800-Series. 0 = No Failure, 1 = 485 Communication Failure.
10.7	Off Scan Mode			Bit 7			0	1.10	Indicates the Poll Mode (parameter #2) is in Off Scan Mode. 0 = Not in Off Scan Mode, 1 = Off Scan Mode.
11	Sensor Range Status	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.10	
11.0	DP less than DP Zero			Bit 0			0	1.10	Indicates if the DP Reading (parameter #19) is less than the calibrated DP Zero Calibration Point (parameter #13). 0 = DP Reading greater than or equal to DP Zero Calibration Point, 1 = DP Reading less than DP Zero Calibration Point.
11.1	SP less than SP Zero			Bit 1			0	1.10	Indicates if the SP Reading (parameter #35) is less than the calibrated SP Zero Calibration Point (parameter #29). 0 = SP Reading greater than or equal to SP Zero Calibration Point, 1 = SP Reading less than SP Zero Calibration Point.
11.2	TMP less than TMP Zero			Bit 2			0	1.10	Indicates if the TMP Reading (parameter #50) is less than the calibrated TMP Zero Calibration Point (parameter #44). 0 = TMP Reading greater than or equal to TMP Zero Calibration Point, 1 = TMP Reading less than TMP Zero Calibration Point.
11.3	DP greater than DP Span			Bit 3			0	1.10	Indicates if the DP Reading (parameter #19) is greater than the calibrated DP Span Calibration Point (parameter #17). 0 = DP Reading less than or equal to DP Span Calibration Point, 1 = DP Reading greater than DP Span Calibration Point.

Point Type 108: Multi-Variable Sensor

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
11.4	SP greater than SP Span			Bit 4			0	1.10	Indicates if the SP Reading (parameter #35) is greater than the calibrated SP Span Calibration Point (parameter #33). 0 = SP Reading less than or equal to SP Span Calibration Point, 1 = SP Reading greater than SP Span Calibration Point.
11.5	TMP greater than TMP Span			Bit 5			0	1.10	Indicates if the TMP Reading (parameter #50) is greater than the calibrated TMP Span Calibration Point (parameter #48). 0 = TMP Reading less than or equal to TMP Span Calibration Point, 1 = TMP Reading greater than TMP Span Calibration Point.
11.6	Not Used			Bit 6			0		Not Used
11.7	Not Used			Bit 7			0		Not Used
12	Static Pressure Effect	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Calibrated Zero Shift for DP in inches of H_2O or kPa.
13	DP Zero Calibration Point	R/O	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Lowest calibrated DP Reading value in inches of H_2O or kPa.
14	DP Calibration Mid Point #1	R/O	Both	FL	4	Any valid IEEE 754 float	250.0	1.10	Second lowest calibrated DP Reading value in inches of H_2O or kPa.
15	DP Calibration Mid Point #2	R/O	Both	FL	4	Any valid IEEE 754 float	250.0	1.10	Third lowest or highest calibrated DP Reading value in inches of H_2O or kPa.
16	DP Calibration Mid Point #3	R/O	Both	FL	4	Any valid IEEE 754 float	250.0	1.10	Second highest calibrated DP Reading value in inches of H_2O or kPa.
17	DP Span Calibration Point	R/O	Both	FL	4	Any valid IEEE 754 float	250.0	1.10	Highest calibrated DP Reading value in inches of H_2O or kPa.
18	Manual DP	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.10	Current DP Reading while performing calibration in inches of H_2O or kPa.
19	DP Reading	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Current Differential Pressure in inches of H_2O or kPa.
20	DP Reverse Reading	R/O	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Current Differential Pressure Reversed in inches of H_2O or kPa.
21	DP Fault Value	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Value that the DP Reading (parameter #19) will be set to if a 485 Communication Failure or Sensor Communication Failure occurs in inches of H_2O or kPa. The DP Reverse Reading (parameter #20) will be set to the same value of the opposite sign.
22	DP Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	DP Alarm value for DP Low Alarm in inches of H_2O or kPa.
23	DP High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	250.0	1.10	DP Alarm value for DP High Alarm in inches of H_2O or kPa.

Point Type 108: Multi-Variable Sensor

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
24	DP Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.10	Provides a range (±) that the DP Reading (parameter #19) may move between without causing another alarm in inches of H_2O or kPa.
25	DP Alarming	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, DP alarms may be generated and sent to the Alarm Log. 0 = DP Alarming Disabled, 1 = DP Alarming Enabled.
26	DP SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition clears. 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled.
27	DP SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled.
28	DP Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.10	
28.0	Low Alarm			Bit 0			0	1.10	If set, the DP Reading (parameter #19) is less than or equal to the DP Low Alarm EU (parameter #22). If clear, the DP Reading (parameter #19) is greater than the DP Low Alarm EU (parameter #22).
28.1	Not Used			Bit 1			0		Not Used
28.2	High Alarm			Bit 2			0	1.10	If set, the DP Reading (parameter #19) is greater than or equal to the DP High Alarm EU (parameter #23). If clear, the DP Reading (parameter #19) is less than the DP High Alarm EU (parameter #23).
28.3	Not Used			Bit 3			0		Not Used
28.4	Not Used			Bit 4			0		Not Used
28.5	Not Used			Bit 5			0		Not Used
28.6	Point Fail Alarm			Bit 6			0	1.10	Indicates a failure in the hardware or software of the MVS for Differential Pressure. 0 = No Failure, 1 = DP Failure.
28.7	Not Used			Bit 7			0		Not Used
29	SP Zero Calibration Point	R/O	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Lowest calibrated SP Reading value in PSI or kPa.
30	SP Calibration Mid Point #1	R/O	Both	FL	4	Any valid IEEE 754 float	800.6447	1.10	Second lowest calibrated SP Reading value in PSI or kPa.
31	SP Calibration Mid Point #2	R/O	Both	FL	4	Any valid IEEE 754 float	800.6447	1.10	Third lowest or highest calibrated SP Reading value in PSI or kPa.
32	SP Calibration Mid Point #3	R/O	Both	FL	4	Any valid IEEE 754 float	800.6447	1.10	Second highest calibrated SP Reading value in PSI or kPa.

Point Type 108: Multi-Variable Sensor

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
33	SP Span Calibration Point	R/O	Both	FL	4	Any valid IEEE 754 float	800.6447	1.10	Highest calibrated SP Reading value in PSI or kPa.
34	Manual SP	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.10	Current SP Reading while performing calibration in PSI or kPa.
35	SP Reading	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Current Static Pressure in PSI or kPa.
36	SP Fault Value	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Value that the SP Reading (parameter #35) will be set to if a 485 Communication Failure or Sensor Communication Failure occurs in PSI or kPa.
37	SP Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	SP Alarm value for SP Low Alarm in PSI or kPa.
38	SP High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	800.6447	1.10	SP Alarm value for SP High Alarm in PSI or kPa.
39	SP Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.10	Provides a range (±) that the SP Reading (parameter #35) may move between without causing another alarm in PSI or kPa.
40	SP Alarming	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, SP alarms may be generated and sent to the Alarm Log. 0 = SP Alarming Disabled, 1 = SP Alarming Enabled.
41	SP SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition clears. 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled.
42	SP SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled.
43	SP Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.10	
43.0	Low Alarm			Bit 0			0	1.10	If set, the SP Reading (parameter #35) is less than or equal to the SP Low Alarm EU (parameter #37). If clear, the SP Reading (parameter #35) is greater than the SP Low Alarm EU (parameter #37).
43.1	Not Used			Bit 1			0		Not Used
43.2	High Alarm			Bit 2			0	1.10	If set, the SP Reading (parameter #35) is greater than or equal to the SP High Alarm EU (parameter #38). If clear, the SP Reading (parameter #35) is less than the SP High Alarm EU (parameter #38).
43.3	Not Used			Bit 3			0		Not Used
43.4	Not Used			Bit 4			0		Not Used
43.5	Not Used			Bit 5			0		Not Used

Point Type 108: Multi-Variable Sensor

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
43.6	Point Fail Alarm			Bit 6			0	1.10	Indicates a failure in the hardware or software of the MVS for Static Pressure. 0 = No Failure, 1 = SP Failure.
43.7	Not Used			Bit 7			0		Not Used
44	TMP Zero Calibration Point	R/O	Both	FL	4	Any valid IEEE 754 float	-459.4	1.10	Lowest calibrated TMP Reading value in °F or °C.
45	TMP Calibration Mid Point #1	R/O	Both	FL	4	Any valid IEEE 754 float	800.6	1.10	Second lowest calibrated TMP Reading value in °F or °C.
46	TMP Calibration Mid Point #2	R/O	Both	FL	4	Any valid IEEE 754 float	800.6	1.10	Third lowest (or highest) calibrated TMP Reading value in °F or °C.
47	TMP Calibration Mid Point #3	R/O	Both	FL	4	Any valid IEEE 754 float	800.6	1.10	Second highest calibrated TMP Reading value in °F or °C.
48	TMP Span Calibration Point	R/O	Both	FL	4	Any valid IEEE 754 float	800.6	1.10	Highest calibrated TMP Reading value in °F or °C.
49	Manual TMP	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.10	Current TMP Reading while performing calibration in °F or °C.
50	TMP Reading	R/W	Both	FL	4	Any valid IEEE 754 float	-459.4	1.10	Current Temperature in °F or °C.
51	TMP Fault Value	R/W	User	FL	4	Any valid IEEE 754 float	-459.4	1.10	Value that the TMP Reading (parameter #50) will be set to if a 485 Communication Failure or Sensor Communication Failure occurs in °F or °C.
52	TMP Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	-459.4	1.10	TMP Alarm value for TMP Low Alarm in °F or °C.
53	TMP High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	800.6	1.10	TMP Alarm value for TMP High Alarm in °F or °C.
54	TMP Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	2.0	1.10	Provides a range (±) that the TMP Reading (parameter #50) may move between without causing another alarm in °F or °C.
55	TMP Alarming	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, TMP alarms may be generated and sent to the Alarm Log. 0 = TMP Alarming Disabled, 1 = TMP Alarming Enabled.
56	TMP SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition clears. 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled.
57	TMP SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled.
58	TMP Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.10	

Point Type 108: Multi-Variable Sensor

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
58.0	Low Alarm			Bit 0			0	1.10	If set, the TMP Reading (parameter #50) is less than or equal to the TMP Low Alarm EU (parameter #52). If clear, the TMP Reading (parameter #50) is greater than the TMP Low Alarm EU (parameter #52).
58.1	Not Used			Bit 1			0		Not Used
58.2	High Alarm			Bit 2			0	1.10	If set, the TMP Reading (parameter #50) is greater than or equal to the TMP High Alarm EU (parameter #53). If clear, the TMP Reading (parameter #50) is less than the TMP High Alarm EU (parameter #53).
58.3	Not Used			Bit 3			0		Not Used
58.4	Not Used			Bit 4			0		Not Used
58.5	Not Used			Bit 5			0		Not Used
58.6	Point Fail Alarm			Bit 6			0	1.10	Indicates a failure in the hardware or software of the MVS for Temperature. 0 = No Failure, 1 = TMP Failure.
58.7	Not Used			Bit 7			0		Not Used
59	Calibrate Command	R/W	Both	UINT8	1	$0 \rightarrow 6$	0	1.10	Tells the MVS Interface what process variable is being calibrated. 0 = No Action, 1 = Calibrate DP, 2 = Calibrate SP, 3 = Calibrate TMP, 6 = Save MVS Calibration, 7 = Set Defaults.
60	Calibrate Type	R/W	Both	UINT8	1	$0 \rightarrow 7$	0	1.10	Tells the MVS Interface what point is being calibrated. 0 = None, 1 = Set Zero, 2 = Set Span, 3 = Set Mid Point #1, 4 = Set Mid Point #2, 5 = Set Mid Point #3, 6 = Sensor Setup, 7 = Sensor Restore.
61	Calibrate Set Value	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Desired value for a calibration point.
62	Sensor SRBX on Clear	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.10	Indicates a SRBX alarm is desired if an alarm condition clears. 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled. Note: For 485 and Sensor Communication Failures only.
63	Sensor SRBX on Set	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.10	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled. Note: For 485 and Sensor Communication Failures only.
64	SP Zero Shift	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Calibrated Zero Shift for SP in inches of H_2O or kPa.

Point Type 108: Multi-Variable Sensor

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
65	MVS Type	R/O	System	UINT8	1	$0 \rightarrow 2$	0	2.20	Indicates the module/sensor type. Valid values are: 0 = Standard MVS 1 = Smart MVS 2 = 3095
66	Temperature Bias	R/W	User	FL	4	Any valid IEEE 754 float	0	2.00	Indicates the calibrated temperature bias for the MVS temperature reading. Units based on units parameter (#3).

3.4.36 Point Type 109: System Analog Inputs

Description: Point type 109 provides parameters for setting up and reading analog inputs.

Number of Logical Points: 5 logical points for System Analog Inputs may exist.

Storage Location: Point type 109 is saved to internal configuration memory.

Table 3-37: Point Type 109, System Analog Inputs

Point Type 109: System Analog Inputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id.	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	Logic 0: "Battery " Logic 1: "Charge In " Logic 2: "Module " Logic 3: "AI Default" Logic 4: "OnBoardTmp"	1.10	Identification name for specific System AI. Values must be printable ASCII characters. **Note**: Point Tag ID on logical 1 is "Voltage In" when a PM-30 power module is installed (Version 1.30).
1	Units Tag	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	Logic 0: "Volts " Logic 1: "Volts " Logic 2: "Volts " Logic 3: " " Logic 4: "Degrees C "	1.10	Describes the units used by the System AI. Values must be printable ASCII characters.
2	Scanning	R/W	User	UINT8	1	0 → 1	1	1.10	If disabled, field inputs are ignored and no changes will occur unless manually entered. 0 = Disabled, 1 = Enabled.
3	Scan Period	R/W	User	FL	4	1.0 → 43,200.0	1.0	1.10	Number of seconds between updates of the System AI.
4	Actual Scan Time	R/O	System	FL	4	1.0 → 43,200.0	1.0	1.10	Actual number of seconds between updates of the System AI.

Point Type 109: System Analog Inputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Filter	R/W	User	UINT8	1	0 → 99	0	1.10	Percentage of last raw A/D reading to be weighted with the new raw A/D reading.
6	Averaging	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, the filtered raw A/D value is averaged over the Scan Period. If disabled, the current filtered raw A/D value is used when the Scan Period is reached. 0 = Disabled, 1 = Enabled.
7	Raw A/D Input	R/W	Both	UINT16	2	0 → 65,535	0	1.10	Raw A/D reading used to calculate the EU Value (parameter #21).
8	Zero Raw	R/W	User	UINT16	2	0 → 65,535	Logic 0: 0 Logic 1: 0 Logic 2: 0 Logic 3: 819 Logic 4: 10	1.10	Lowest raw A/D input.
9	Span Raw	R/W	User	UINT16	2	0 → 65,535	Logic 0: 255 Logic 1: 255 Logic 2: 255 Logic 3: 4095 Logic 4: 179	1.10	Highest raw A/D input.
10	Zero EU	R/O	User	FL	4	Any valid IEEE 754 float	Logic 0: 0.0 Logic 1: 0.0 Logic 2: 0.0 Logic 3: 0.0 Logic 4: -40.0	1.10	Lowest EU value.

Point Type 109: System Analog Inputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
11	Span EU	R/O	User	FL	4	Any valid IEEE 754 float	Logic 0: 16.225 Logic 1: 19.95 Logic 2: 16.225 Logic 3: 100.0 Logic 4: 125.0	1.10	Highest EU value.
12	EU Value	R/W	Both	FL	4	Any valid IEEE 754 float	Logic 0: 12.0 Logic 1: 13.5 Logic 2: 12.0 Logic 3: 0.0 Logic 4: 20.0	1.10	Value in Engineering Units.
13	Clipping	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, then the EU Value (parameter #12) cannot be less than the Low Low Alarm EU (parameter #14) or greater than the High High Alarm EU (parameter #17). If disabled, no limiting of the EU Value (parameter #12) takes place. 0 = Disabled, 1 = Enabled.
14	Low Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float EXCEPT +B, then it is >=9.00Volts	Logic 0: 10.6 Logic 1: 10.0 Logic 2: 10.6 Logic 3: -20.0 Logic 4: -25.0	1.10	Alarm value for Low Low Alarm and minimum EU Value (parameter #12) if Clipping (parameter #13) is enabled. **Note**: Low Low Alarm is 10.1 on logicals 0 and 2 when a PM-30 power module is installed (Version 1.30)

Point Type 109: System Analog Inputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
15	Low Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	Logic 0: 11.0 Logic 1: 11.0 Logic 2: 11.0 Logic 3: -10.0 Logic 4: -15.0	1.10	Alarm value for Low Alarm.
16	High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	Logic 0: 14.5 Logic 1: 17.0 Logic 2: 14.5 Logic 3: 110.0 Logic 4: 100.0	1.10	Alarm value for High Alarm.
17	High High Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	Logic 0: 15.0 Logic 1: 18.5 Logic 2: 15.0 Logic 3: 120.0 Logic 4: 110.0	1.10	Alarm value for High High Alarm and maximum EU Value (parameter #12) if Clipping (parameter #13) is enabled.

Point Type 109: System Analog Inputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
18	Rate Alarm EU	R/W	User	FL	4	Any valid IEEE 754 float	Logic 0: 3.0 Logic 1: 3.0 Logic 2: 3.0 Logic 3: 5.0 Logic 4: 8.0	1.10	Alarm value for maximum change of EU Value (parameter #12) between Scan Periods.
19	Alarm Deadband	R/W	User	FL	4	Any valid IEEE 754 float	Logic 0: 0.5 Logic 1: 1.0 Logic 2: 0.5 Logic 3: 2.0 Logic 4: 5.0	1.10	Provides a range (±) that the EU Value (parameter #12) may move between without causing another alarm.
20	Alarming	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, alarms may be generated and sent to the Alarm Log. 0 = Disabled, 1 = Enabled.
21	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition clears. 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled.
22	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled.
23	Alarm Code	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.10	
23.0	Low Alarm			Bit 0			0	1.10	If set, the EU Value (parameter #12) is less than or equal to the Low Alarm EU (parameter #15). If clear, the EU Value (parameter #12) is greater than the Low Alarm EU (parameter #15).
23.1	Low Low Alarm			Bit 1			0	1.10	If set, the EU Value (parameter #12) is less than or equal to the Low Low Alarm EU (parameter #14). If clear, the EU Value (parameter #12) is greater than the Low Low Alarm EU (parameter #14).

Point Type 109: System Analog Inputs

Param #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
23.2	High Alarm			Bit 2			0	1.10	If set, the EU Value (parameter #12) is greater than or equal to the High Alarm EU (parameter #16). If clear, the EU Value (parameter #12) is less than the High Alarm EU (parameter #16).
23.3	High High Alarm			Bit 3			0	1.10	If set, the EU Value (parameter #12) is greater than or equal to the High High Alarm EU (parameter #17). If clear, the EU Value (parameter #12) is less than the High High Alarm EU (parameter #17).
23.4	Rate Alarm			Bit 4			0	1.10	If set, the EU Value (parameter #12) change from last Scan Period to the new Scan Period is greater than or equal to the Rate Alarm EU (parameter #18). If clear, the EU Value (parameter #12) change from last Scan Period to the new Scan Period is less than the Rate Alarm EU (parameter #18).
23.5	Not Used			Bit 5			0		Not Used
23.6	Point Fail Alarm			Bit 6			0	1.10	If set, the System AI’s hardware is reporting a malfunction. If clear, the System AI’s hardware is operating properly.
23.7	Scanning Disabled Alarm			Bit 7			0	1.10	If set, the Scanning (parameter #2) has been disabled. If clear, the Scanning (parameter #2) has been enabled.
24	Units	R/W	User	UINT8	1	Logic 0 → 3: 0 → 1 Logic 4: 0 → 3	Logic 0 → 3: 0 Logic 4: 1	1.10	Indicates what units the EU value will be. Logic 0 → 3: 0 = Volts, 1 = milliVolts Logic 4: 0 = °F, 1 = °C, 2 = °K, 3 = °R.

3.4.37 Point Type 110: PID Control Parameters

Description: Point type 110 provides parameters for configuring and controlling PID loops.

Number of Logical Points: 16 logical points for PID Control Parameters may exist, depending on the number of active PIDs.

Storage Location: Point type 110 is saved to internal configuration memory.

Table 3-38: Point Type 110 , PID Control Parameters

Point Type 110: PID Control Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id.	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"PID X" where X is the PID number	1.10	Identification name for specific PID. Values must be printable ASCII characters.
1	PID Mode	R/W	User	UINT8	1	0 → 3	0	1.10	Indicates whether the PID is disabled, in manual mode, automatic mode, or in remote setpoint mode. 0 = PID Disabled 1 = Manual 2 = Automatic 3 = Remote Setpoint
2	Loop Period	R/W	User	FL	4	0.05 → Any positive valid IEEE 754 float	1.5	1.10	Desired frequency of execution of the PID algorithm in seconds.
3	Actual Loop Period	R/O	System	FL	4	0.05 → Any positive valid IEEE 754 float	0	1.10	Actual frequency of execution of the PID algorithm in seconds.
4	Action on Process Variable Failure (Reserved)	R/O	User	UINT8	1	0 → 1	0	1.10	Indicates what action to take if the process variable has questionable data. 0 = No action 1 = Switch mode to manual
5	Discrete Output Control	R/W	User	UINT8	1	0 → 1	0	1.10	0 = Analog Control 1 = DO Control 2 = Brooks Control (AC I/O)
6	Reset Mode	R/W	User	UINT8	1	0 → 1	1	1.10	Indicates whether the PID will be disabled on a restart of any kind or retain its last mode. 0 = Retain last mode 1 = Disable after Reset.

Point Type 110: PID Control Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
7	Manual Tracking	R/W	User	UINT8	1	0 → 1	0	1.10	If in Manual Mode, the Primary Setpoint is set equal to the current Primary Process Variable. If disabled, nothing occurs. 0 = Disable Manual Tracking 1 = Enable Manual Tracking.
8	Primary Input Point	R/W	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 105,5→148,10 or 13 and TLP 96,0→5,2→11and TLP 98,0→31,1→20 and TLP 108,0→11,19→20 or 35 or 50 and TLP 106,5→148,22 and TLP 107,5→148,9 and TLP 112,0→11,53→54 and TLP 113,0→11,26 or 28 or 30 and 114,0→11,0→3 and TLP 115,0→11,14 or 16 or 18 and TLP 116,0→11,0→3	0,0,0	1.10	The parameter assigned to read the Primary Process Variable (parameter #9) from.
9	Primary Process Variable	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Input value for the Primary Loop.
10	Primary Setpoint Point	R/W	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 105,5→148,10 or 13 and TLP 96,0→5,2→11and TLP 98,0→31,1→20 and TLP 108,0→11,19→20 or 35 or 50 and TLP 106,5→148,22 and TLP 107,5→148,14 and TLP 112,0→11,53→54 and TLP 114,0→11,0→3 and TLP 116,0→11,0→3	0,0,0	1.10	The parameter assigned to read the primary setpoint (parameter #11) from.
11	Primary Setpoint	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Desired value of the Primary Process Variable (parameter #9).

Point Type 110: PID Control Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	Primary Setpoint Low Limit	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Lowest allowed value for the primary setpoint (parameter #11).
13	Primary Setpoint High Limit	R/W	User	FL	4	Any valid IEEE 754 float	1000000.0	1.10	Highest allowed value for the primary setpoint (parameter #11).
14	Primary Setpoint Maximum Change Rate	R/W	User	FL	4	Any positive valid IEEE 754 float	0.0	1.10	Maximum rate of change allowed for the actual setpoint used by the Primary Loop in engineering units per minute (EU/minute). A value of 0 disables this option.
15	Primary Proportional Gain	R/W	User	FL	4	Any positive valid IEEE 754 float	0.5	1.10	Proportional gain (K_P) of the Primary Loop.
16	Primary Integral Gain	R/W	User	FL	4	Any positive valid IEEE 754 float	4.0	1.10	Integral gain (K_I) of the Primary Loop.
17	Primary Derivative Gain	R/W	User	FL	4	Any positive valid IEEE 754 float	0.0	1.10	Derivative gain (K_D) of the Primary Loop.
18	Primary Scale Factor	R/W	User	FL	4	Any valid IEEE 754 float	-1.0	1.10	Scale factor (F_S) of the Primary Loop.
19	Primary Integral Deadband	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Range (±) that the error at time t (e_t) must be greater than or equal to for the Primary Loop to include the K_I term for the change in output calculation.
20	Primary Change in Output	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.10	Calculated change in output from the Primary Loop.
21	Override Loop Mode	R/W	User	UINT8	1	0 → 2	0	1.10	Indicates which loops have been enabled for control. 0 = Primary Loop Only 1 = Primary and Override Loop 2 = Override Loop Only.
22	Loop Switch Select	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates when to switch to the Override Loop based upon whether the Primary change in output is less than or greater than the Override change in output. 0 = Low Override 1 = High Override.

Point Type 110: PID Control Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
23	Override Input Point	R/W	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 105,5→148,10 or 13 and TLP 96,0→5,2→11and TLP 98,0→31,1→20 and TLP 108,0→11,19→20 or 35 or 50 and TLP 106,5→148,22 and TLP 107,5→148,9 and TLP 112,0→11,53→54 and TLP 113,0→11,26 or 28 or 30 and 114,0→11,0→3 and TLP 115,0→11,14 or 16 or 18 and TLP 116,0→11,0→3	0,0,0	1.10	The parameter assigned to read the Override Process Variable (parameter #24) from.
24	Override Process Variable	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Input value for the Override Loop.
25	Override Setpoint Point	R/W	User	TLP	3	TLP 0,0,0 and TLP 60→77, 0→255, 0→255 (must be float) and TLP 103,5→148,21 and TLP 105,5→148,10 or 13 and TLP 96,0→5,2→11and TLP 98,0→31,1→20 and TLP 108,0→11,19→20 or 35 or 50 and TLP 106,5→148,22 and TLP 107,5→148,14 and TLP 112,0→11,53→54 and TLP 114,0→11,0→3 and TLP 116,0→11,0→3	0,0,0	1.10	The parameter assigned to read the override setpoint (parameter #26) from
26	Override Setpoint	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Desired value of the Override Process Variable (parameter #24).
27	Override Setpoint Low Limit	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Lowest allowed value for the override setpoint (parameter #26).
28	Override Setpoint High Limit	R/W	User	FL	4	Any valid IEEE 754 float	1000000.0	1.10	Highest allowed value for the override setpoint (parameter #26).

Point Type 110: PID Control Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
29	Override Setpoint Maximum Change Rate	R/W	User	FL	4	Any positive valid IEEE 754 float	0.0	1.10	Maximum rate of change allowed for the actual setpoint used by the Override Loop in engineering units per minute (EU/minute).
30	Override Proportional Gain	R/W	User	FL	4	Any positive valid IEEE 754 float	0.5	1.10	Proportional gain (K_P) of the Override Loop.
31	Override Integral Gain	R/W	User	FL	4	Any positive valid IEEE 754 float	4.0	1.10	Integral gain (K_I) of the Override Loop.
32	Override Derivative Gain	R/W	User	FL	4	Any positive valid IEEE 754 float	0.0	1.10	Derivative gain (K_D) of the Override Loop.
33	Override Scale Factor	R/W	User	FL	4	Any valid IEEE 754 float	-1.0	1.10	Scale factor (F_S) of the Override Loop.
34	Override Integral Deadband	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Range (±) that the error at time t (e_t) must be greater than or equal to for the Override Loop to include the K_I term for the change in output calculation.
35	Override Change in Output	R/O	System	FL	4	Any valid IEEE 754 float	0.0	1.10	Calculated change in output from the Override Loop.
36	Switch Status	R/O	System	UINT8	1	0 → 2	0	1.10	Indicates what loop is currently being used to control the process variable. 0 = Neither 1 = Primary Loop 2 = Override Loop.
37	Current Output of PID	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Value that is sent to current output.
38	Output of PID point	R/W	User	TLP	3	TLP 0,0,0 and {if DO Control Off TLP 104,5→148,12 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20 and TLP 60→77, 0→255, 0→255 (must be float)}	0,0,0	1.10	The parameter assigned to write the analog control output of the PID loop to. Only used of DO Control (parameter #5) is Off.
39	Discrete Open PID output	R/W	User	TLP	3	TLP 0,0,0 and {if DO Control On TLP 102,5→148,20 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20 and TLP 60→77, 0→255, 0→255 (must be float) }	0,0,0	1.10	The parameter assigned to write the increase/open output to. Only used if DO Control (parameter #5) is On.

Point Type 110: PID Control Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
40	Discrete Close PID output	R/W	User	TLP	3	TLP 0,0,0 and {if DO Control On TLP 102,5→148,20 and TLP 96,0→5,2→11 and TLP 98,0→31,1→20 and TLP 60→77, 0→255, 0→255 (must be float) }	0,0,0	1.10	The parameter assigned to write the decrease/closed output to. Only used if DO Control (parameter #5) is On.
41	Output Low Limit	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Minimum allowable PID output. If the change in output calculated by the loop would cause the current value of the output to go below this value, the output will be set to this value.
42	Output High Limit	R/W	User	FL	4	Any valid IEEE 754 float	100.0	1.10	Maximum allowable PID output. If the change in output calculated by the loop would cause the current value of the output to go above this value, the output will be set to this value.
43	Output Low Limit Status	R/O	System	UINT8	1	0 → 1	0	1.10	Indication that the output of the PID loop has been clipped by the low output limit. 0 = Not limited, 1 = Low output limited.
44	Output High Limit Status	R/O	System	UINT8	1	0 → 1	0	1.10	Indication that the output of the PID loop has been clipped by the high output limit. 0 = Not limited, 1 = High output limited.
45	Primary Process Variable Status	R/O	System	UINT8	1	0 → 2	0	1.10	Indication of the status of the primary process variable. 0 = No error, 1 = Questionable data, 2 = Invalid TLP.
46	Primary Setpoint Low Limit Status	R/O	System	UINT8	1	0 → 1	0	1.10	Indication that the primary setpoint has been clipped by the low setpoint limit. 0 = Not limited, 1 = Low setpoint limited.
47	Primary Setpoint High Limit Status	R/O	System	UINT8	1	0 → 1	0	1.10	Indication that the primary setpoint has been clipped by the high setpoint limit. 0 = Not limited, 1 = High setpoint limited.
48	Primary Setpoint Rate Limited	R/O	System	UINT8	1	0 → 1	0	1.10	Indication that the primary setpoint currently being used by the PID calculation is currently being limited by the maximum setpoint change rate (parameter #14).
49	Override Process Variable Status	R/O	System	UINT8	1	0 → 2	0	1.10	Indication of the status of the override process variable. 0 = No error, 1 = Questionable data, 2 = Invalid TLP.
50	Override Setpoint Low Limit Status	R/O	System	UINT8	1	0 → 1	0	1.10	Indication that the override setpoint has been clipped by the low setpoint limit. 0 = Not limited, 1 = Low setpoint limited.

Point Type 110: PID Control Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
51	Override Setpoint High Limit Status	R/O	System	UINT8	1	$0 \rightarrow 1$	0	1.10	Indication that the override setpoint has been clipped by the high setpoint limit. 0 = Not limited, 1 = High setpoint limited.
52	Override Setpoint Rate Limited	R/O	System	UINT8	1	$0 \rightarrow 1$	0	1.10	Indication that the override setpoint currently being used by the PID calculation is currently being limited by the maximum setpoint change rate (parameter #29).
53	Override Threshold Value	R/W	User	FL	4	Any positive valid IEEE 754 float	0.0	1.10	The override function will only be allowed to take control if the override process variable is within the threshold value of the override setpoint.
54	Action Wait Time	R/W	User	FL	4	Any positive valid IEEE 754 float	1.0	1.10	When taking an action, this amount of time, in seconds, is added to make sure the process returns to a steady state before a new action is taken. Only used if Brooks Control (parameter #5) is selected.
55	Upstream Output Point	R/W	User	TLP	3	TLP 0,0,0 and TLP 140, X, 37	0,0,0	1.10	The parameter assigned to write the upstream output to. Only used if Brooks Control (parameter #5) is selected. Only valid output is an AC I/O EU TLP
56	Downstream Output Point	R/W	User	TLP	3	TLP 0,0,0 and TLP 140, X, 37	0,0,0	1.10	The parameter assigned to write the downstream output to. Only used if Brooks Control (parameter #5) is selected. Only valid output is an AC I/O EU TLP
57	Valve Dead Time	R/W	User	FL	4	Any positive valid IEEE 754 float	0.0	1.10	An amount of time, in seconds, added to every TDO EU value passed to the AC I/O to account for extra time to break valve seal. Only used if Brooks Control (parameter #5) is selected.

3.4.38 Point Type 117: Modbus Configuration Parameters

Description: Point type 117 provides parameters for setting up the Modbus protocol.

Number of Logical Points: 6 logical points for Modbus Configuration Parameters may exist corresponding to LOI through Comm 5.

Storage Location: Point type 117 is saved to internal configuration memory.

Table 3-39: Point Type 117, Modbus Configuration Parameters

Point Type 117: Modbus Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Transmission Mode	R/W	User	UINT8	1	0 → 1	0	1.10	Controls the type of transmission mode desired. 0 = RTU Mode 1 = ASCII Mode
1	Byte Order	R/W	User	UINT8	1	0 → 1	0	1.10	Controls which byte is sent out first for floats, short integers, and long integers. 0 = LSB first (Associated with little-endian processors) 1 = MSB first (Associated with big-endian processors)
2	Event Log Enable	R/W	User	UINT8	1	0 → 1	1	1.10	Controls if changes to Modbus registers are logged to the event log or not (Slave mode only). 0 = No Logging 1 = Log to Event Log
3	Slave Exception Status	R/O	System	UINT8	1	0 → 3	0	1.10	Contains the error code for the last Modbus message received (Slave mode only). 0 = No Error 1 = Illegal Function 2 = Illegal Data Address 3 = Illegal Data Value
4	Master Poll Request Trigger	R/W	Both	UINT8	1	0 → 1	0	1.10	Controls the initiation of a Modbus master polling sequence (Master mode only). 0 = No polling 1 = Begin polling with the entry in the Modbus master table indicated by the master starting request number (parameter #5) and continue through the table for the number of master requests (parameter #6). This parameter will be reset by the system when the polling sequence has been completed.

Point Type 117: Modbus Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Master Starting Request Number	R/W	User	UINT16	2	1 - 75	1	1.10	Contains the request number in the Modbus master table to begin with when the Modbus master poll request trigger (parameter #4) is set (Master mode only).
6	Master Number of Requests	R/W	User	UINT16	2	0 → 75	0	1.10	Contains the total number of Modbus requests to be made when the Modbus master poll request trigger (parameter #4) is set (Master mode only).
7	Master Continuous Polling Enable	R/W	User	UINT8	1	0 → 1	0	1.10	Controls whether the Modbus master poll request sequence specified is executed on a continuous basis (Master mode only). 0 = Continuous polling disabled 1 = Continuous polling enabled
8	Master Poll Request Delay	R/W	User	FL	4	1 → 86400 (24 hrs)	1	1.10	Contains the delay time in seconds between continuous master poll requests (Continuous poll mode only). **Note**: Default and minimum changed to 1 in Version 2.40.
9	Reserved	R/O	System	UINT8	1	0	0	1.10	Reserved for future use.
10	Low Integer Scale	R/W	User	INT16	2	-32768 → 32767	0	1.10	Contains the lower limit value when scaling floating-point data.
11	High Integer Scale	R/W	User	INT16	2	-32768 → 32767	4095	1.10	Contains the upper limit value when scaling floating-point data.
12	Low Float Scale 1	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the lower limit in float range 1 when converting integers to floats and vice-versa.
13	High Float Scale 1	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the upper limit in float range 1 when converting integers to floats and vice-versa.
14	Low Float Scale 2	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the lower limit in float range 2 when converting integers to floats and vice-versa.
15	High Float Scale 2	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the upper limit in float range 2 when converting integers to floats and vice-versa.
16	Low Float Scale 3	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the lower limit in float range 3 when converting integers to floats and vice-versa.
17	High Float Scale 3	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the upper limit in float range 3 when converting integers to floats and vice-versa.

Point Type 117: Modbus Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
18	Low Float Scale 4	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the lower limit in float range 4 when converting integers to floats and vice-versa.
19	High Float Scale 4	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the upper limit in float range 4 when converting integers to floats and vice-versa.
20	Low Float Scale 5	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the lower limit in float range 5 when converting integers to floats and vice-versa.
21	High Float Scale 5	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the upper limit in float range 5 when converting integers to floats and vice-versa.
22	Low Float Scale 6	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the lower limit in float range 6 when converting integers to floats and vice-versa.
23	High Float Scale 6	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the upper limit in float range 6 when converting integers to floats and vice-versa.
24	Low Float Scale 7	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the lower limit in float range 7 when converting integers to floats and vice-versa.
25	High Float Scale 7	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the upper limit in float range 7 when converting integers to floats and vice-versa.
26	Low Float Scale 8	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the lower limit in float range 8 when converting integers to floats and vice-versa.
27	High Float Scale 8	R/W	User	FL	4	Any IEEE 754 floating point number	0.0	1.10	Contains the upper limit in float range 8 when converting integers to floats and vice-versa.
28	Master Poll Timeout	R/W	User	U8	1	1 → 255	30	1.10	Amount of time in seconds Modbus master will wait for a slave response. (Master mode only).
29	Master Poll Number of Retries	R/W	User	U8	1	0 → 255	2	1.10	Number of retries Modbus Master will attempt on a particular request number in the Master Poll Table before giving-up and going to the next request number. (Master mode only).

3.4.39 Point Type 118: Modbus Register to TLP Mapping Parameters

Description: Point type 118 provides parameters for mapping ROC Plus Protocol TLPs to Modbus Protocol Registers.

Number of Logical Points: 24 logical points for Modbus Register to TLP Mapping may exist.

Storage Location: Point type 118 is saved to internal configuration memory.

Table 3-40: Point Type 118, Modbus Register to TLP Mapping

Point Type 118: Modbus Register to TLP Mapping Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag Id	R/W	User	AC	10	0x20 → 0x7E for each byte	'Reg Map #'	1.10	String that describes the instance of the mapping table.
1	Start Register #1	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting register number for the first range of Modbus registers that map to ROC Plus Protocol TLP(s).
2	End Register #1	R/W	User	UINT16	2	0 → 65535	0	1.10	The ending register number for the first range of Modbus registers that map to ROC Plus Protocol TLP(s).
3	ROC Parameter(s) (Reg Range 1)	R/W	User	TLP	3	Any valid TLP (with exception of Program Flash Parameters, PT90)	0, 0, 0	1.10	The starting ROC Plus Protocol TLP that maps to the first range of Modbus registers.
4	Indexing (Reg Range 1)	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
5	Conversion Code (Reg Range 1)	R/W	User	UINT8	1	0 → 29, 37 41 →81	0	1.10	Contains the code to convert the ROC800-Series data into a format that is compatible to a Modbus device. Valid conversion codes are: 0 = No Conversion 1 = Float to Signed Integer, Float Scale 1 2 = Float to Signed Integer, Float Scale 2 3 = Float to Signed Integer, Float Scale 3 4 = Float to Signed Integer, Float Scale 4 5 = Float to Signed Integer, Float Scale 5 6 = Float to Signed Integer, Float Scale 6 7 = Float to Signed Integer, Float Scale 7 8 = Float to Signed Integer, Float Scale 8 9 = Convert Anything to Signed Long with 1 implied decimal places 10 = Convert Anything to Signed Long with 2 implied decimal places

Point Type 118: Modbus Register to TLP Mapping Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
									11 = Convert Anything to Signed Long with 3 implied decimal places 12 = Convert Anything to Signed Long with 4 implied decimal places 13 = Convert Anything to Signed Long with 5 implied decimal places 14 = Convert Anything to Signed Long with 6 implied decimal places 15 = Convert Anything to Signed Long with 7 implied decimal places 16 = Convert Anything to Signed Long with 8 implied decimal places 17 = Convert Anything to Unsigned Long with 1 implied decimal places 18 = Convert Anything to Unsigned Long with 2 implied decimal places 19 = Convert Anything to Unsigned Long with 3 implied decimal places 20 = Convert Anything to Unsigned Long with 4 implied decimal places 21 = Convert Anything to Unsigned Long with 5 implied decimal places 22 = Convert Anything to Unsigned Long with 6 implied decimal places 23 = Convert Anything to Unsigned Long with 7 implied decimal places 24 = Convert Anything to Unsigned Long with 8 implied decimal places 25 = Convert Anything to Float, No Scaling 26 = Convert Anything to a Signed Short Integer 27 = Convert Anything to a Signed Long Integer 28 = Convert Anything to an Unsigned Short Integer 29 = Convert Anything to an Unsigned Long Integer 37 = Unsiged Byte to Packed Bit 41 = Convert Anything to Signed Short with 1 Impliled Decimal place 42 = Convert Anything to Signed Short with 2 Implied Decimal places 43 = Convert Anything to Signed Short with 3 Implied Decimal places 44 = Convert Anything to Signed Short with 4 Implied Decimal places 45 = Convert Anything to Signed Short with 5 Implied Decimal places 46 = Convert Anything to Signed Short with 6 Implied Decimal places 47 = Convert Anything to Signed Short with 7 Implied Decimal places

Point Type 118: Modbus Register to TLP Mapping Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
									48 = Convert Anything to Signed Short with 8 Implied Decimal places 49 = Convert Anything to Unsigned Short with 1 Implied Decimal place 50 = Convert Anything to Unsigned Short with 2 Implied Decimal places 51 = Convert Anything to Unsigned Short with 3 Implied Decimal places 52 = Convert Anything to Unsigned Short with 4 Implied Decimal places 53 = Convert Anything to Unsigned Short with 5 Implied Decimal places 54 = Convert Anything to Unsigned Short with 6 Implied Decimal places 55 = Convert Anything to Unsigned Short with 7 Implied Decimal places 56 = Convert Anything to Unsigned Short with 8 Implied Decimal places 57 = Convert Anything to Signed Long 0, 1, 2, 3 58 = Convert Anything to Unsigned Long 0, 1, 2, 3 59 = Convert Anything to Signed Long 1, 0 3, 2 60 = Convert Anything to Unsigned Long 1, 0, 3, 2 61 = Convert Anything to Signed Long 2, 3, 0, 1 62 = Convert Anything to Unsigned Long 2, 3, 0, 1 63 = Convert Anything to Signed Long 3, 2, 1, 0 64 = Convert Anything to Unsigned Long 3, 2, 1, 0 65 = IEEE Floating Point Number 0, 1, 2, 3 66 = IEEE Floating Point Number 0, 1, 2, 3, Disregard MSB flag 67 = IEEE Floating Point Number 1, 0, 3, 2 68 = IEEE Floating Point Number 1, 0, 3, 2, Disregard MSB flag 69 = IEEE Floating Point Number 2, 3, 0, 1 70 = IEEE Floating Point Number 2, 3, 0, 1, Disregard MSB flag 71 = IEEE Floating Point Number 3, 2, 1, 0 72 = IEEE Floating Point Number 3, 2, 1, 0, Disregard MSB flag 73 = Double 01, 23, 45, 67, Disregard MSB flag 74 = Double 23, 01, 67, 45, Disregard MSB flag 75 = Double 45, 67, 01, 23, Disregard MSB flag 76 = Double 67, 45, 23, 01, Disregard MSB flag 77 = Double 10, 32, 54, 76, Disregard MSB flag 78 = Double 32, 10, 76, 54, Disregard MSB flag 79 = Double 54, 76, 10, 32, Disregard MSB flag 80 = Double 76, 54, 32, 10, Disregard MSB flag 81 = ASCII, two characters per 16-bit register

Point Type 118: Modbus Register to TLP Mapping Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6	Comm Port (Reg Range 1)	R/W	User	UINT8	1	0 → 5, 255	255	1.10	Communication port the first range of registers map to. 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
7	Start Register #2	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting register number for the second range of Modbus registers that map to ROC Plus Protocol TLP(s).
8	End Register #2	R/W	User	UINT16	2	0 → 65535	0	1.10	The ending register number for the second range of Modbus registers that map to ROC Plus Protocol TLP(s).
9	ROC Parameter(s) (Reg Range 2)	R/W	User	TLP	3	Any valid TLP (with exception of Program Flash Parameters, PT90)	0, 0, 0	1.10	The starting ROC Plus Protocol TLP that maps to the second range of Modbus registers.
10	Indexing (Reg Range 2)	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
11	Conversion Code (Reg Range 2)	R/W	User	UINT8	1	0 → 29, 37, 41 → 81	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #5 for list of conversion codes.
12	Comm Port (Reg Range 2)	R/W	User	UINT8	1	0 → 5, 255	255	1.10	Communication port the second range of registers map to. 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
13	Start Register #3	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting register number for the third range of Modbus registers that map to ROC Plus Protocol TLP(s).
14	End Register #3	R/W	User	UINT16	2	0 → 65535	0	1.10	The ending register number for the third range of Modbus registers that map to ROC Plus Protocol TLP(s).

Point Type 118: Modbus Register to TLP Mapping Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
15	ROC Parameter(s) (Reg Range 3)	R/W	User	TLP	3	Any valid TLP (with exception of Program Flash Parameters, PT90)	0, 0, 0	1.10	The starting ROC Plus Protocol TLP that maps to the third range of Modbus registers.
16	Indexing (Reg Range 3)	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
17	Conversion Code (Reg Range 3)	R/W	User	UINT8	1	0 → 29, 37, 41 → 81	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #5 for list of conversion codes.
18	Comm Port (Reg Range 3)	R/W	User	UINT8	1	0 → 5, 255	255	1.10	Communication port the third range of registers map to. 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
19	Start Register #4	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting register number for the fourth range of Modbus registers that map to ROC Plus Protocol TLP(s).
20	End Register #4	R/W	User	UINT16	2	0 → 65535	0	1.10	The ending register number for the fourth range of Modbus registers that map to ROC Plus Protocol TLP(s).
21	ROC Parameter(s) (Reg Range 4)	R/W	User	TLP	3	Any valid TLP (with exception of Program Flash Parameters, PT90)	0, 0, 0	1.10	The starting ROC Plus Protocol TLP that maps to the fourth range of Modbus registers.
22	Indexing (Reg Range 4)	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
23	Conversion Code (Reg Range 4)	R/W	User	UINT8	1	0 → 29, 37 41 → 81	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #5 for list of conversion codes.

Point Type 118: Modbus Register to TLP Mapping Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
24	Comm Port (Reg Range 4)	R/W	User	UINT8	1	0 → 5, 255	255	1.10	Communication port the fourth range of registers map to. 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
25	Start Register #5	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting register number for the fifth range of Modbus registers that map to ROC Plus Protocol TLP(s).
26	End Register #5	R/W	User	UINT16	2	0 → 65535	0	1.10	The ending register number for the fifth range of Modbus registers that map to ROC Plus Protocol TLP(s).
27	ROC Parameter(s) (Reg Range 5)	R/W	User	TLP	3	Any valid TLP (with exception of Program Flash Parameters, PT90)	0, 0, 0	1.10	The starting ROC Plus Protocol TLP that maps to the fifth range of Modbus registers.
28	Indexing (Reg Range 5)	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
29	Conversion Code (Reg Range 5)	R/W	User	UINT8	1	0 → 29, 37 41 → 81	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #5 for list of conversion codes.
30	Comm Port (Reg Range 5)	R/W	User	UINT8	1	0 → 5, 255	255	1.10	Communication port the fifth range of registers map to. 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
31	Start Register #6	R/W	User	UINT16	2	0 – 65535	0	1.10	The starting register number for the sixth range of Modbus registers that map to ROC Plus Protocol TLP(s).

Point Type 118: Modbus Register to TLP Mapping Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
32	End Register #6	R/W	User	UINT16	2	0 – 65535	0	1.10	The ending register number for the sixth range of Modbus registers that map to ROC Plus Protocol TLP(s).
33	ROC Parameter(s) (Reg Range 6)	R/W	User	TLP	3	Any valid TLP (with exception of Program Flash Parameters, PT90)	0, 0, 0	1.10	The starting ROC Plus Protocol TLP that maps to the sixth range of Modbus registers.
34	Indexing (Reg Range 6)	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
35	Conversion Code (Reg Range 6)	R/W	User	UINT8	1	0 → 29, 37 41 → 81	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #5 for list of conversion codes.
36	Comm Port (Reg Range 6)	R/W	User	UINT8	1	0 → 5, 255	255	1.10	Communication port the sixth range of registers map to. 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
37	Start Register #7	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting register number for the seventh range of Modbus registers that map to ROC Plus Protocol TLP(s).
38	End Register #7	R/W	User	UINT16	2	0 → 65535	0	1.10	The ending register number for the seventh range of Modbus registers that map to ROC Plus Protocol TLP(s).
39	ROC Parameter(s) (Reg Range 7)	R/W	User	TLP	3	Any valid TLP (with exception of Program Flash Parameters, PT90)	0, 0, 0	1.10	The starting ROC Plus Protocol TLP that maps to the seventh range of Modbus registers.
40	Indexing (Reg Range 7)	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
41	Conversion Code (Reg Range 7)	R/W	User	UINT8	1	0 → 29, 37 41 → 81	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #5 for list of conversion codes.

Point Type 118: Modbus Register to TLP Mapping Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
42	Comm Port (Reg Range 7)	R/W	User	UINT8	1	0 → 5, 255	255	1.10	Communication port the seventh range of registers map to. 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
43	Start Register #8	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting register number for the eighth range of Modbus registers that map to ROC Plus Protocol TLP(s).
44	End Register #8	R/W	User	UINT16	2	0 → 65535	0	1.10	The ending register number for the eighth range of Modbus registers that map to ROC Plus Protocol TLP(s).
45	ROC Parameter(s) (Reg Range 8)	R/W	User	TLP	3	Any valid TLP (with exception of Program Flash Parameters, PT90)	0, 0, 0	1.10	The starting ROC Plus Protocol TLP that maps to the eighth range of Modbus registers.
46	Indexing (Reg Range 8)	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
47	Conversion Code (Reg Range 8)	R/W	User	UINT8	1	0 → 29, 37 41 → 81	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #5 for list of conversion codes.
48	Comm Port (Reg Range 8)	R/W	User	UINT8	1	0 → 5, 255	255	1.10	Communication port the eighth range of registers map to. 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
49	Start Register #9	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting register number for the ninth range of Modbus registers that map to ROC Plus Protocol TLP(s).

Point Type 118: Modbus Register to TLP Mapping Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
50	End Register #9	R/W	User	UINT16	2	0 → 65535	0	1.10	The ending register number for the ninth range of Modbus registers that map to ROC Plus Protocol TLP(s).
51	ROC Parameter(s) (Reg Range 9)	R/W	User	TLP	3	Any valid TLP (with exception of Program Flash Parameters, PT90)	0, 0, 0	1.10	The starting ROC Plus Protocol TLP that maps to the ninth range of Modbus registers.
52	Indexing (Reg Range 9)	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
53	Conversion Code (Reg Range 9)	R/W	User	UINT8	1	0 → 29, 37 41 → 81	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #5 for list of conversion codes.
54	Comm Port (Reg Range 9)	R/W	User	UINT8	1	0 → 5, 255	255	1.10	Communication port the ninth range of registers map to. 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
55	Start Register #10	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting register number for the tenth range of Modbus registers that map to ROC Plus Protocol TLP(s).
56	End Register #10	R/W	User	UINT16	2	0 → 65535	0	1.10	The ending register number for the tenth range of Modbus registers that map to ROC Plus Protocol TLP(s).
57	ROC Parameter(s) (Reg Range 10)	R/W	User	TLP	3	Any valid TLP (with exception of Program Flash Parameters, PT90)	0, 0, 0	1.10	The starting ROC Plus Protocol TLP that maps to the tenth range of Modbus registers.
58	Indexing (Reg Range 10)	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
59	Conversion Code (Reg Range 10)	R/W	User	UINT8	1	0 → 29, 37 41 → 81	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #5 for list of conversion codes.

Point Type 118: Modbus Register to TLP Mapping Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
60	Comm Port (Reg Range 10)	R/W	User	UINT8	1	0 → 5, 255	255	1.10	Communication port the tenth range of registers map to. 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
61	Start Register #11	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting register number for the 11th range of Modbus registers that map to ROC Plus Protocol TLP(s).
62	End Register #11	R/W	User	UINT16	2	0 → 65535	0	1.10	The ending register number for the 11th range of Modbus registers that map to ROC Plus Protocol TLP(s).
63	ROC Parameter(s) (Reg Range 11)	R/W	User	TLP	3	Any valid TLP (with exception of Program Flash Parameters, PT90)	0, 0, 0	1.10	The starting ROC Plus Protocol TLP that maps to the 11th range of Modbus registers.
64	Indexing (Reg Range 11)	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
65	Conversion Code (Reg Range 11)	R/W	User	UINT8	1	0 → 29, 37 41 → 81	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #5 for list of conversion codes.
66	Comm Port (Reg Range 11)	R/W	User	UINT8	1	0 → 5, 255	255	1.10	Communication port the 11th range of registers map to. 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
67	Start Register #12	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting register number for the 12th range of Modbus registers that map to ROC Plus Protocol TLP(s).
68	End Register #12	R/W	User	UINT16	2	0 → 65535	0	1.10	The ending register number for the 12th range of Modbus registers that map to ROC Plus Protocol TLP(s).

Point Type 118: Modbus Register to TLP Mapping Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
69	ROC Parameter(s) (Reg Range 12)	R/W	User	TLP	3	Any valid TLP (with exception of Program Flash Parameters, PT90)	0, 0, 0	1.10	The starting ROC Plus Protocol TLP that maps to the 12th range of Modbus registers.
70	Indexing (Reg Range 12)	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
71	Conversion Code (Reg Range 12)	R/W	User	UINT8	1	0 → 29, 37 41 → 81	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #5 for list of conversion codes.
72	Comm Port (Reg Range 12)	R/W	User	UINT8	1	0 → 5, 255	255	1.10	Communication port the 12th range of registers map to. 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
73	Start Register #13	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting register number for the 13th range of Modbus registers that map to ROC Plus Protocol TLP(s).
74	End Register #13	R/W	User	UINT16	2	0 → 65535	0	1.10	The ending register number for the 13th range of Modbus registers that map to ROC Plus Protocol TLP(s).
75	ROC Parameter(s) (Reg Range 13)	R/W	User	TLP	3	Any valid TLP (with exception of Program Flash Parameters, PT90)	0, 0, 0	1.10	The starting ROC Plus Protocol TLP that maps to the 13th range of Modbus registers.
76	Indexing (Reg Range 13)	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
77	Conversion Code (Reg Range 13)	R/W	User	UINT8	1	0 → 29, 37 41 → 81	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #5 for list of conversion codes.

Point Type 118: Modbus Register to TLP Mapping Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
78	Comm Port (Reg Range 13)	R/W	User	UINT8	1	0 → 5, 255	255	1.10	Communication port the 13th range of registers map to. 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
79	Start Register #14	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting register number for the 14th range of Modbus registers that map to ROC Plus Protocol TLP(s).
80	End Register #14	R/W	User	UINT16	2	0 → 65535	0	1.10	The ending register number for the 14th range of Modbus registers that map to ROC Plus Protocol TLP(s).
81	ROC Parameter(s) (Reg Range 14)	R/W	User	TLP	3	Any valid TLP (with exception of Program Flash Parameters, PT90)	0, 0, 0	1.10	The starting ROC Plus Protocol TLP that maps to the 14th range of Modbus registers.
82	Indexing (Reg Range 14)	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
83	Conversion Code (Reg Range 14)	R/W	User	UINT8	1	0 → 29, 37 41 → 81	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #5 for list of conversion codes.
84	Comm Port (Reg Range 14)	R/W	User	UINT8	1	0 → 5, 255	255	1.10	Communication port the 14th range of registers map to. 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports
85	Start Register #15	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting register number for the 15th range of Modbus registers that map to ROC Plus Protocol TLP(s).

Point Type 118: Modbus Register to TLP Mapping Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
86	End Register #15	R/W	User	UINT16	2	0 → 65535	0	1.10	The ending register number for the 15th range of Modbus registers that map to ROC Plus Protocol TLP(s).
87	ROC Parameter(s) (Reg Range 15)	R/W	User	TLP	3	Any valid TLP (with exception of Program Flash Parameters, PT90)	0, 0, 0	1.10	The starting ROC Plus Protocol TLP that maps to the 15th range of Modbus registers.
88	Indexing (Reg Range 15)	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates whether multiple registers access consecutive logical numbers or consecutive parameters from the starting TLP. 0 = Logical indexing, 1 = Parameter indexing.
89	Conversion Code (Reg Range 15)	R/W	User	UINT8	1	0 → 29, 37 41 → 81	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #5 for list of conversion codes.
90	Comm Port (Reg Range 15)	R/W	User	UINT8	1	0 → 5, 255	255	1.10	Communication port the 15th range of registers map to. 0 = LOI 1 = Comm Port 1 2 = Comm Port 2 3 = Comm Port 3 4 = Comm Port 4 5 = Comm Port 5 255 = All Comm Ports

3.4.40 Point Type 119: Modbus Event, Alarm, and History Table

Description: Point type 119 provides parameters that enable Modbus to capture the event log, the alarm log, and history archives.

Number of Logical Points: 1 logical point for Modbus Event, Alarm, and History Table may exist.

Storage Location: Point type 119 is saved to internal configuration memory.

Table 3-41: Point Type 119, Modbus Event, Alarm, and History Table

Point Type 119: Modbus Event, Alarm, and History Table

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Event/Alarm Register	R/W	User	UINT16	2	0 → 65535	32	1.10	Contains a unique register number that indicates the request is for Events and Alarm records.
1	Current Date Register	R/W	User	UINT16	2	0 → 65535	7046	1.10	Contains a unique register that allows a Modbus read/write command to access the current date in MMDDYY format
2	Current Time Register	R/W	User	UINT16	2	0 → 65535	7047	1.10	Contains a unique register that allows a Modbus read/write command to access the current time in HHMMSS format
3	Periodic History Register #1	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the first range of history points.
4	Daily History Register #1	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the first range of history points.
5	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 1.
6	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 1.
7	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 1.

Point Type 119: Modbus Event, Alarm, and History Table

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
8	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. Conversion codes are: 0 = No Conversion 65 = IEEE Floating Point Number 0, 1, 2, 3 66 = IEEE Floating Point Number 0, 1, 2, 3, Disregard MSB flag 67 = IEEE Floating Point Number 1, 0, 3, 2 68 = IEEE Floating Point Number 1, 0, 3, 2, Disregard MSB flag 69 = IEEE Floating Point Number 2, 3, 0, 1 70 = IEEE Floating Point Number 2, 3, 0, 1, Disregard MSB flag 71 = IEEE Floating Point Number 3, 2, 1, 0 72 = IEEE Floating Point Number 3, 2, 1, 0, Disregard MSB flag
9	Periodic History Register #2	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the second range of history points.
10	Daily History Register #2	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the second range of history points.
11	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 2.
12	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 2.
13	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 2.
14	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
15	Periodic History Register #3	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the third range of history points.
16	Daily History Register #3	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the third range of history points.
17	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 3.
18	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 3.
19	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 3.

Point Type 119: Modbus Event, Alarm, and History Table

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
20	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
21	Periodic History Register #4	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the fourth range of history points.
22	Daily History Register #4	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the fourth range of history points.
23	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 4.
24	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 4.
25	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 4.
26	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
27	Periodic History Register #5	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the fifth range of history points.
28	Daily History Register #5	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the fifth range of history points.
29	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 5.
30	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 5.
31	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 5.
32	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
33	Periodic History Register #6	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the sixth range of history points.
34	Daily History Register #6	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the sixth range of history points.
35	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 6.

Point Type 119: Modbus Event, Alarm, and History Table

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
36	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 6.
37	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 6.
38	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
39	Periodic History Register #7	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the seventh range of history points.
40	Daily History Register #7	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the seventh range of history points.
41	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 7.
42	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 7.
43	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 7.
44	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
45	Periodic History Register #8	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the eighth range of history points.
46	Daily History Register #8	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the eighth range of history points.
47	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 8.
48	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 8.
49	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 8.
50	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
51	Periodic History Register #9	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the ninth range of history points.

Point Type 119: Modbus Event, Alarm, and History Table

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
52	Daily History Register #9	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the ninth range of history points.
53	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 9.
54	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 9.
55	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 9.
56	Conversion Code	R/W	User	UINT8	1	0 → 8, 25 → 29, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
57	Periodic History Register #10	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the tenth range of history points.
58	Daily History Register #10	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the tenth range of history points.
59	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 10.
60	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 10.
61	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 10.
62	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
63	Periodic History Register #11	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the eleventh range of history points.
64	Daily History Register #11	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the eleventh range of history points.
65	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 11.
66	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 11.
67	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 11.

Point Type 119: Modbus Event, Alarm, and History Table

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
68	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
69	Periodic History Register #12	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the twelfth range of history points.
70	Daily History Register #12	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the twelfth range of history points.
71	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 12.
72	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 12.
73	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 12.
74	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
75	Periodic History Register #13	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the thirteenth range of history points.
76	Daily History Register #13	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the thirteenth range of history points.
77	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 13.
78	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 13.
79	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 13.
80	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
81	Periodic History Register #14	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the fourteenth range of history points.
82	Daily History Register #14	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the fourteenth range of history points.
83	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 14.

Point Type 119: Modbus Event, Alarm, and History Table

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
84	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 14.
85	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 14.
86	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
87	Periodic History Register #15	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the fifteenth range of history points.
88	Daily History Register #15	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the fifteenth range of history points.
89	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 15.
90	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 15.
91	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 15.
92	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
93	Periodic History Register #16	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the sixteenth range of history points.
94	Daily History Register #16	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the sixteenth range of history points.
95	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 16.
96	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 16.
97	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 16.
98	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
99	Periodic History Register #17	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the seventeenth range of history points.

Point Type 119: Modbus Event, Alarm, and History Table

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
100	Daily History Register #17	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the seventeenth range of history points.
101	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 17.
102	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 17.
103	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 17.
104	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
105	Periodic History Register #18	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the eighteenth range of history points.
106	Daily History Register #18	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the eighteenth range of history points.
107	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 18.
108	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 18.
109	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 18.
110	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-SEries data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
111	Periodic History Register #19	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the nineteenth range of history points.
112	Daily History Register #19	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the nineteenth range of history points.
113	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 19.
114	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 19.
115	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 19.

Point Type 119: Modbus Event, Alarm, and History Table

Parameter #	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
116	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
117	Periodic History Register #20	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for periodic values for the twentieth range of history points.
118	Daily History Register #20	R/W	User	UINT16	2	0 → 65535	0	1.10	Contains a unique register number that indicates the request is for daily values for the twentieth range of history points.
119	History Segment	R/W	User	UINT8	1	0→10	0	1.10	Contains the history segment for range 20.
120	Start History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the starting history point number for range 20.
121	End History Point	R/W	User	UINT16	2	0→199	0	1.10	Contains the ending history point number for range 20.
122	Conversion Code	R/W	User	UINT8	1	0, 65 → 72	0	1.10	Contains the conversion code to convert the ROC800-Series data into a format that is compatible to a Modbus device. **Note**: See parameter #8 for conversion codes.
123	History Index Mode	R/W	User	UINT8	1	0 →	0	1.10	0: EFM Extensions Mode: History Indexes (mapped to TLP[124,X,5] and [124,X,6]) will be returned as one less - accounting for roll-over - corresponding to last entry location. History data will be returned for the index requested. 1: Override mode 1: History Indexes (mapped to TLP[124,X,5] and [124,X,6]) will be returned unmodified (index is to the next record to be written). History data will be returned for the index requested. 2: Override mode 2: History Indexes (mapped to TLP[124,X,5] and [124,X,6]) will be returned unmodified (index is to the next record to be written). History data will be returned at an index one less than the index requested, accounting for rollover. If a request for history data at an index beyond the number of valid indices is received, the ROC will respond with history data at the last valid index (For example, if there are 35 daily entries, valid indices are 0-34. Requests for index 35, 36, 37, etc. will all return history for index 34). Override mode 2 was implemented in firmware version 2.10.

3.4.41 Point Type 120: Modbus Master Modem Configuration

Description: Point type 120 provides parameters for configuring Modbus Protocol master modem communication.

Number of Logical Points: 5 logical points for Modbus Master Modem Configuration may exist corresponding to Comm1 through Comm 5.

Storage Location: Point type 120 is saved to internal configuration memory.

Table 3-42: Point Type 120, Modbus Master Modem Configuration

Point Type 120: Modbus Master Modem Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag Id	R/W	User	AC	10	0x20 → 0x7E for each byte	'Modem #'	1.10	String that describes the instance of the Master modem table.
1	1st RTU Address	R/W	User	UINT8	1	0 → 255	0	1.10	Associates an RTU address to the Connect Command.
2	1st Connect Command	R/W	User	AC	30	0x20 → 0x7E for each byte	'ATDT'	1.10	A 40-character modem command typically used to represent the telephone number of the slave RTU.
3	2nd RTU Address	R/W	User	UINT8	1	0 → 255	0	1.10	Associates an RTU address to the Connect Command.
4	2nd Connect Command	R/W	User	AC	30	0x20 → 0x7E for each byte	'ATDT'	1.10	A 40-character modem command typically used to represent the telephone number of the slave RTU.
5	3rd RTU Address	R/W	User	UINT8	1	0 → 255	0	1.10	Associates an RTU address to the Connect Command.
6	3rd Connect Command	R/W	User	AC	30	0x20 → 0x7E for each byte	'ATDT'	1.10	A 40-character modem command typically used to represent the telephone number of the slave RTU.
7	4th RTU Address	R/W	User	UINT8	1	0 → 255	0	1.10	Associates an RTU address to the Connect Command.
8	4th Connect Command	R/W	User	AC	30	0x20 → 0x7E for each byte	'ATDT'	1.10	A 40-character modem command typically used to represent the telephone number of the slave RTU.
9	5th RTU Address	R/W	User	UINT8	1	0 → 255	0	1.10	Associates an RTU address to the Connect Command.
10	5th Connect Command	R/W	User	AC	30	0x20 → 0x7E for each byte	'ATDT'	1.10	A 40-character modem command typically used to represent the telephone number of the slave RTU.
11	6th RTU Address	R/W	User	UINT8	1	0 → 255	0	1.10	Associates an RTU address to the Connect Command.

Point Type 120: Modbus Master Modem Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	6^{th} Connect Command	R/W	User	AC	30	0x20 → 0x7E for each byte	'ATDT'	1.10	A 40-character modem command typically used to represent the telephone number of the slave RTU.

3.4.42 Point Type 121: Modbus Master Table

Description: Point type 121 provides parameters for configuring Modbus Protocol master communication.

Number of Logical Points: 15 logical points for Modbus Master Table may exist (3 tables per communication port).

Storage Location: Point type 121 is saved to internal configuration memory.

Table 3-43: Point Type 121, Modbus Master Table

Point Type 121: Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag Id	R/W	User	AC	10	0x20 → 0x7E for each byte	'MastTbl #'	1.10	String that describes the instance of the Master table.
1	RTU 1 Address	R/W	User	UINT8	1	0 →255	0	1.10	Contains RTU 1 Address the Modbus Query is destined for
2	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus function code to be sent to the slave device on RTU 1. The Modbus function codes are: 0 = Disables the query. 1 = Send register contents to master (Read Coil Status) 2 = Send register contents to master (Read Input Status) 3 = Send register contents to master (Read Holding Registers) 4 = Send register contents to master (Read Input Registers) 5 = Set a single register value on slave (Force Single Coil) 6 = Set a single register value on slave (Preset Single Register) 8 = Return data sent to slave back to master (Loopback) 15 = Set multiple register values on a slave (Force Multiple Coils) 16 = Set multiple register values on a slave (Preset Multiple Registers) 17 =
3	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 1.
4	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
5	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers the master either reads or writes.

Point Type 121: Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. The communication status codes are: 0 = Inactive or start of transmission 1 = Received timeout error 2 = Received address check 3 = Received Function Code check 4 = Number of expected bytes check 8 = Valid slave response 128 = Write ROC data error 129 = Access ROC data error 130 = Master Table error **Note**: Status values 0 and 3 through 8 are active on the master transmission. These values appear for a very short time and step to the next value if the process is without error. If an error occurs in the step, then the value is present until the next transmission is requested. A transmission without error has a status value of 8, Valid Slave Response.
7	RTU 2 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 2 Address the Modbus Query is destined for
8	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 2. **Note**: See parameter#2 for the Modbus function codes.
9	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 2.
10	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
11	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
12	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
13	RTU 3 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 3 Address the Modbus Query is destined for.
14	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 3. **Note**: See parameter#2 for the Modbus function codes.
15	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 3.
16	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.

Point Type 121: Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
17	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
18	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
19	RTU 4 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 4 Address the Modbus Query is destined for
20	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 4. **Note**: See parameter#2 for the Modbus function codes.
21	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 4.
22	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series9) where the data will either be stored for a read, or provided for a write.
23	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
24	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
25	RTU 5 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 5 Address the Modbus Query is destined for
26	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 5. **Note**: See parameter#2 for the Modbus function codes.
27	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 5.
28	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
29	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
30	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
31	RTU 6 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 6 Address the Modbus Query is destined for
32	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 6. **Note**: See parameter#2 for the Modbus function codes.

Point Type 121: Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
33	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 6.
34	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
35	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
36	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
37	RTU 7 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 7 Address the Modbus Query is destined for
38	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 7. **Note**: See parameter#2 for the Modbus function codes.
39	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 7.
40	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
41	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
42	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
43	RTU 8 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 8 Address the Modbus Query is destined for
44	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 8. **Note**: See parameter#2 for the Modbus function codes.
45	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 8.
46	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
47	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
48	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.

Point Type 121: Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
49	RTU 9 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 9 Address the Modbus Query is destined for
50	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 9. **Note**: See parameter#2 for the Modbus function codes.
51	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 9.
52	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
53	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
54	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
55	RTU 10 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 10 Address the Modbus Query is destined for
56	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 10. **Note**: See parameter#2 for the Modbus function codes.
57	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 10.
58	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
59	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
60	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
61	RTU 11 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 11 Address the Modbus Query is destined for
62	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 11. **Note**: See parameter#2 for the Modbus function codes.
63	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 11.
64	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.

Point Type 121: Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
65	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
66	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
67	RTU 12 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 12 Address the Modbus Query is destined for
68	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 12. **Note**: See parameter#2 for the Modbus function codes.
69	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 12.
70	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
71	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
72	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
73	RTU 13 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 13 Address the Modbus Query is destined for
74	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 13. **Note**: See parameter#2 for the Modbus function codes.
75	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 13.
76	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
77	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
78	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
79	RTU 14 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 14 Address the Modbus Query is destined for
80	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 14. **Note**: See parameter#2 for the Modbus function codes.

Point Type 121: Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
81	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 14.
82	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
83	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
84	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
85	RTU 15 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 15 Address the Modbus Query is destined for
86	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 15. **Note**: See parameter#2 for the Modbus function codes.
87	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 15.
88	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
89	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
90	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
91	RTU 16 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 16 Address the Modbus Query is destined for
92	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 16. **Note**: See parameter#2 for the Modbus function codes.
93	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 16.
94	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
95	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
96	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.

Point Type 121: Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
97	RTU 17 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 17 Address the Modbus Query is destined for
98	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 17. **Note**: See parameter#2 for the Modbus function codes.
99	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 17.
100	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
101	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
102	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
103	RTU 18 Address	R/W	User	UINT8	1	0 – 255	0	1.10	Contains RTU 18 Address the Modbus Query is destined for
104	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 18. **Note**: See parameter#2 for the Modbus function codes.
105	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 18.
106	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
107	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
108	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
109	RTU 19 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 19 Address the Modbus Query is destined for
110	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 19. **Note**: See parameter#2 for the Modbus function codes.
111	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 19.
112	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.

Point Type 121: Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Lengt h	Range	Default	Ver	Description of functionality and meaning of values
113	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
114	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
115	RTU 20 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 20 Address the Modbus Query is destined for
116	Function Code Number	R/W	User	UINT8	1	0 →15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 20. **Note**: See parameter#2 for the Modbus function codes.
117	Slave Register Number	R/W	User	UINT16	2	0 →535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 20.
118	Master Register Number	R/W	User	UINT16	2	0 →535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
119	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
120	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
121	RTU 21 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 21 Address the Modbus Query is destined for
122	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 21. **Note**: See parameter#2 for the Modbus function codes.
123	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 21.
124	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
125	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
126	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
127	RTU 22 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 22 Address the Modbus Query is destined for
128	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 22. **Note**: See parameter#2 for the Modbus function codes.

Point Type 121: Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
129	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 22.
130	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
131	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
132	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
133	RTU 23 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 23 Address the Modbus Query is destined for
134	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 23. **Note**: See parameter#2 for the Modbus function codes.
135	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 23.
136	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
137	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
138	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.
139	RTU 24 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 24 Address the Modbus Query is destined for
140	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 24. **Note**: See parameter#2 for the Modbus function codes.
141	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 24.
142	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
143	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
144	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.

Point Type 121: Modbus Master Table

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
145	RTU 25 Address	R/W	User	UINT8	1	0 → 255	0	1.10	Contains RTU 25 Address the Modbus Query is destined for
146	Function Code Number	R/W	User	UINT8	1	0 → 6, 15, 16	0	1.10	Specifies the Modbus Function Code to be sent to the slave device on RTU 25. **Note**: See parameter#2 for the Modbus function codes.
147	Slave Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the slave device for the query on RTU 25.
148	Master Register Number	R/W	User	UINT16	2	0 → 65535	0	1.10	The starting Modbus register number on the Master device (ROC800-Series) where the data will either be stored for a read, or provided for a write.
149	Number of registers	R/W	User	UINT8	1	1 → 120	1	1.10	The number of registers for the master to either read or write.
150	Communication Status	R/O	System	UINT8	1	0 → 8, 128 → 131, 144, 145	0	1.10	Displays the status of the master query. **Note**: See parameter#6 for the communication status codes.

3.4.43 Point Type 122: DS800 Configuration

Description: Point type 122 provides parameters used to configure DS800. This table is speculative and will be modified if/when more information is available

Number of Logical Points: 1 logical point for DS800 Configuration may exist.

Storage Location: Point type 122 is saved to internal configuration memory.

Table 3-44: Point Type 122, DS800 Configuration

Point Type 122: DS800 Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Power Switch	R/W	User	UINT8	1	0,1	1	1.10	Turns DS800 on and off. Valid values are: 0 = Off 1 = On
1	RSI Enable	R/W	User	UINT8	1	0,1	1	1.10	Enables/Disables the DS800 serial task. Changes to this parameter take affect when DS800 is stopped and started again. Valid values are: 0 = Disable 1 = Enable
2	ETCP Enable	R/W	User	UINT8	1	0,1	1	1.10	Enables/Disables the DS800 TCP/IP task. Changes to this parameter take affect when DS800 is stopped and started again.Valid values are: 0 = Disable 1 = Enable
3	IXD Enable	R/W	User	UINT8	1	0,1	1	1.10	Enables/Disables the DS800 IXD task. Changes to this parameter take affect when DS800 is stopped and started again.Valid values are” 0 = Disable 1 = Enable
4	RSI Running	R/O	System	UINT8	1	0,1	1	1.10	Indicates whether the DS800 serial task is currently running. Valid values are: 0 = Not running. 1 = Running.
5	ETCP Running	R/O	System	UINT8	1	0,1	1	1.10	Indicates whether the DS800 TCP/IP task is currently running. Valid values are: 0 = Not running 1 = Running.

Point Type 122: DS800 Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6	IXD Running	R/O	System	UINT8	1	0,1	1	1.10	Indicates whether or not the DS800 IXD task is currently running. Valid values are: 0 = Not running. 1 = Running.
7	Clean Stored Resources	R/W	User	UINT8	1	0,1	0	1.10	Setting this parameter to '1' removes all stored resources from file system. This does NOT stop resources that may be running, but running resources will not be reloaded when the Power Switch is toggled.

3.4.44 Point Type 123: Security – Group Configuration

Description: Point type 123 provides parameters to define security groups, which work in conjunction with point type 92 parameters to define which users are a member of which group.

Number of Logical Points: 1 logical point for this point type may exist.

Storage Location: Point type 123 is saved to internal configuration memory.

Table 3-45: Point Type 123, Security – Group Configuration

Point Type 123: Security – Group Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Group #1	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
1	Group #2	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
2	Group #3	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
3	Group #4	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
4	Group #5	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
5	Group #6	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
6	Group #7	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
7	Group #8	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
8	Group #9	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
9	Group #10	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
10	Group #11	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
11	Group #12	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
12	Group #13	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier

Point Type 123: Security – Group Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
13	Group #14	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
14	Group #15	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
15	Group #16	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
16	Group #17	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
17	Group #18	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
18	Group #19	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier
19	Group #20	R/W	User	AC	20	0x20 → 0x7E for each byte	“”	1.10	Group identifier

3.4.45 Point Type 124: History Segment Configuration

Description: Point Type 124 provides parameters that configure the number of history points that exist in a history segment, as well as specify the sizes of the history points in that segment. This point type also controls the sampling rate for periodic entries, and it allows you to turn off archiving for history points in a given segment.

Number of Logical Points: 11 logical units of this point type may exist

Storage Location: Point type 124 is saved to configuration memory.

Table 3-46: Point Type 124, History Segment Configuration

Point Type 124: History Segment Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Segment Description	R/W	User	AC	10	0x20 → 0x7E for each byte	Logic 0: “General 00” Logic 1 – 10: “Segment XX”	1.10	Identifies what the segment of history is used for. For logical points 1 – 10, “XX” is the ordered number of the history type.
1	Segment Size	Logic 0: R/O Logic 1 - 10: R/W	User	UINT16	2	0 – 200	Logic 0: 200 Logic 1 – 10: 0	1.10	Specifies how many history points are in the history segment. This parameter is R/O for Logic 0. This parameter can not be modified from an FST. This value cannot be set less than Number of Configured Points.
2	Maximum Segment Size	R/O	System	UINT16	2	200	200	1.10	Specifies the maximum number of history points that may be configured for the history segment.
3	Periodic Entries	R/W	User	UINT16	2	0 - 65535	840	1.10	Number of periodic entries per history point in the history segment. Actual upper range is limited by available free space.
4	Daily Entries	R/W	User	UINT16	2	0 - 65535	35	1.10	Number of daily entries per history point in the history segment.
5	Periodic Index	R/O	System	UINT16	2	0 – (#Periodic Entries – 1)	0	1.10	Location in each history point for the segment where the next periodic entry will be saved.
6	Daily Index	R/O	System	UINT16	2	0 – (#Daily Entries – 1)	0	1.10	Location in each history point for the segment where the next daily entry will be saved.

Point Type 124: History Segment Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
7	Periodic Sample Rate	R/W	User	UINT8	1	1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60	60	1.10	The number of minute intervals that pass before an entry is made in the periodic history.
8	Contract Hour	R/W	User	UINT8	1	0 – 23	0	1.10	Hour that indicates the beginning of a new day.
9	ON/OFF Switch	R/W	User	UINT8	1	0 – 1	1	1.10	Switch that controls history logging for the history segment. Logging is suspended while the switch is off. 0 = OFF 1 = ON
10	Free Space	R/O	System	UINT32	4	0 - 187000	187000	1.10	Specifies the number of history entries that are unaccounted for and may be added to history points in various segments. This value applies to all history segments.
11	Force End of Day	R/W	User	UINT8	1	0 – 1	0	1.10	Allows the user to force an end of day for the history segment. 0 = No Force, 1 = Force End of Day
12	Number of Configured Points	R/O	System	UINT16	2	0-200	0	1.10	Number of history points that are configured in the segment.
13	User Weighting TLP	R/W	User	TLP	3	Any numerical parameter (excluding TLPs and ACs)	0,0,0	2.40	Indicates the parameter the system should use as the weight when averaging Type 6 (User Weighted Average)

3.4.46 Point Type 125: History Segment 0 Point Configuration

Description: Point Type 125 is the history configuration point type for History Segment 0.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 0.

Storage Location: Point type 125 will be saved to internal configuration memory.

Table 3-47: Point Type 125, History Segment 0 Point Configuration

Point Type 125, History Segment 0 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.10	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.10	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	Any parameter may be logged except parameters of Data Type TLP or AC	{0,0,0}	1.10	TLP points to a value to be archived by history.
3	Archive Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines how the system archives a data point to history. Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines the rate of accumulation of the averaging technique and, in conjunction with the Archive Type parameter (3) further defines how the system archives history data. Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day Averaging Type (Archive Type = 128): 0 = None (History point not defined) 5 = Linear Averaging 6 = User Weighted Averaging (Ver. 2.40)
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current value of parameter being logged.

Point Type 125, History Segment 0 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed yesterday.

3.4.47 Point Type 126: History Segment 1 Point Configuration

Description: Point Type 126 provides parameters to configure point types for History Segment 1.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 1.

Storage Location: Point type 126 is saved to internal configuration memory.

Table 3-48: Point Type 126, History Segment 1 Point Configuration

Point Type 126: History Segment 1 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.10	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.10	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	Any parameter may be logged except parameters of Data Type TLP or AC	{0,0,0}	1.10	TLP points to a value to be archived by history.
3	Archive Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines how the system archives a data point to history. Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines the rate of accumulation of the averaging technique and, in conjunction with the Archive Type parameter (3) further defines how the system archives history data. Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day Averaging Type (Archive Type = 128): 0 = None (History point not defined) 5 = Linear Averaging 6 = User Weighted Averaging (Ver. 2.40)

Point Type 126: History Segment 1 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed yesterday.

3.4.48 Point Type 127: History Segment 2 Point Configuration

Description: Point Type 127 provides parameters to configure point types for History Segment 2

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 2.

Storage Location: Point type 127 is saved to internal configuration memory.

Table 3-49: Point Type 127, History Segment 2 Point Configuration

Point Type 127: History Segment 2 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.10	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.10	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	Any parameter may be logged except parameters of Data Type TLP or AC	{0,0,0}	1.10	TLP points to a value to be archived by history.
3	Archive Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines how the system archives a data point to history. Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines the rate of accumulation of the averaging technique and, in conjunction with the Archive Type parameter (3) further defines how the system archives history data. Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day Averaging Type (Archive Type = 128): 0 = None (History point not defined) 5 = Linear Averaging 6 = User Weighted Averaging (Ver. 2.40)

Point Type 127: History Segment 2 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed yesterday.

3.4.49 Point Type 128: History Segment 3 Point Configuration

Description: Point Type 128 provides parameters to configure point types for History Segment 3.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 3.

Storage Location: Point type 128 is saved to internal configuration memory.

Table 3-50: Point Type 128, History Segment 3 Point Configuration

Point Type 128, History Segment 3 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.10	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.10	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	Any parameter may be logged except parameters of Data Type TLP or AC	{0,0,0}	1.10	TLP points to a value to be archived by history.
3	Archive Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines how the system archives a data point to history. Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines the rate of accumulation of the averaging technique and, in conjunction with the Archive Type parameter (3) further defines how the system archives history data. Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day Averaging Type (Archive Type = 128): 0 = None (History point not defined) 5 = Linear Averaging 6 = User Weighted Averagng (Ver. 2.40)

Point Type 128, History Segment 3 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed yesterday.

3.4.50 Point Type 129: History Segment 4 Point Configuration

Description: Point Type 129 provides parameters to configure point types for History Segment 4.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 4.

Storage Location: Point type 129 is saved to internal configuration memory.

Table 3-51: Point Type 129, History Segment 4 Point Configuration

Point Type 129: History Segment 4 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.10	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.10	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	Any parameter may be logged except parameters of Data Type TLP or AC	{0,0,0}	1.10	TLP points to a value to be archived by history.
3	Archive Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines how the system archives a data point to history. Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines the rate of accumulation of the averaging technique and, in conjunction with the Archive Type parameter (3) further defines how the system archives history data. Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day Averaging Type (Archive Type = 128): 0 = None (History point not defined) 5 = Linear Averaging 6 = User Weighted Averaging (Ver. 2.40)

Point Type 129: History Segment 4 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed yesterday.

3.4.51 Point Type 130: History Segment 5 Point Configuration

Description: Point Type 130 provides parameters to configure point types for History Segment 5.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 5.

Storage Location: Point type 130 is saved to internal configuration memory.

Table 3-52: Point Type 130, History Segment 5 Point Configuration

Point Type 130: History Segment 5 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.10	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.10	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	Any parameter may be logged except parameters of Data Type TLP or AC	{0,0,0}	1.10	TLP points to a value to be archived by history.
3	Archive Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines how the system archives a data point to history. Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines the rate of accumulation of the averaging technique and, in conjunction with the Archive Type parameter (3) further defines how the system archives history data. Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day Averaging Type (Archive Type = 128): 0 = None (History point not defined) 5 = Linear Averaging 6 = User Weighted Averaging (Ver 2.40)

Point Type 130: History Segment 5 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed yesterday.

3.4.52 Point Type 131: History Segment 6 Point Configuration

Description: Point Type 131 provides parameters to configure point types for History Segment 6.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 6.

Storage Location: Point type 131 is saved to internal configuration memory.

Table 3-53: Point Type 131, History Segment 6 Point Configuration

Point Type 131: History Segment 6 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.10	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.10	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	Any parameter may be logged except parameters of Data Type TLP or AC	{0,0,0}	1.10	TLP points to a value to be archived by history.
3	Archive Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines how the system archives a data point to history. Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines the rate of accumulation of the averaging technique and, in conjunction with the Archive Type parameter (3) further defines how the system archives history data. Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day Averaging Type (Archive Type = 128): 0 = None (History point not defined) 5 = Linear Averaging 6 = User Weighted Averaging (Ver 2.40)
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current value of parameter being logged.

Point Type 131: History Segment 6 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed yesterday.

3.4.53 Point Type 132: History Segment 7 Point Configuration

Description: Point Type 132 provides parameters to configure point types for History Segment 7.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 7.

Storage Location: Point type 132 is saved to internal configuration memory.

Table 3-54: Point Type 132, History Segment 7 Point Configuration

Point Type 132: History Segment 7 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.10	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.10	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	Any parameter may be logged except parameters of Data Type TLP or AC	{0,0,0}	1.10	TLP points to a value to be archived by history.
3	Archive Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines how the system archives a data point to history. Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines the rate of accumulation of the averaging technique and, in conjunction with the Archive Type parameter (3) further defines how the system archives history data. Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day Averaging Type (Archive Type = 128): 0 = None (History point not defined) 5 = Linear Averaging 6 = User Weighted Averaging (Ver 2.40)

Point Type 132: History Segment 7 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed yesterday.

3.4.54 Point Type 133: History Segment 8 Point Configuration

Description: Point Type 133 provides parameters to configure point types for History Segment 8.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 8.

Storage Location: Point type 133 is saved to internal configuration memory.

Table 3-55: Point Type 133, History Segment 8 Point Configuration

Point Type 133, History Segment 8 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.10	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.10	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	Any parameter may be logged except parameters of Data Type TLP or AC	{0,0,0}	1.10	TLP points to a value to be archived by history.
3	Archive Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines how the system archives a data point to history. Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines the rate of accumulation of the averaging technique and, in conjunction with the Archive Type parameter (3) further defines how the system archives history data. Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day Averaging Type (Archive Type = 128): 0 = None (History point not defined) 5 = Linear Averaging 6 = User Weighted Averaging (Ver 2.40)

Point Type 133, History Segment 8 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed yesterday.

3.4.55 Point Type 134: History Segment 9 Point Configuration

Description: Point Type 134 provides parameters to configure point types for History Segment 9.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 9.

Storage Location: Point type 134 is saved to internal configuration memory.

Table 3-56: Point Type 134, History Segment 9 Point Configuration

Point Type 134, History Segment 9 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.10	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.10	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	Any parameter may be logged except parameters of Data Type TLP or AC	{0,0,0}	1.10	TLP points to a value to be archived by history.
3	Archive Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines how the system archives a data point to history. Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines the rate of accumulation of the averaging technique and, in conjunction with the Archive Type parameter (3) further defines how the system archives history data. Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day Averaging Type (Archive Type = 128): 0 = None (History point not defined) 5 = Linear Averaging 6 = User Weighted Averaging (Ver 2.40)

Point Type 134, History Segment 9 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed yesterday.

3.4.56 Point Type 135: History Segment 10 Point Configuration

Description: Point Type 135 provides parameters to configure point types for History Segment 10.

Number of Logical Points: Number of logical points varies depending on the segment size parameter for History Segment 10.

Storage Location: Point type 135 is saved to internal configuration memory.

Table 3-57: Point Type 135, History Segment 10 Point Configuration

Point Type 135: History Segment 10 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag ID	R/O	System	AC	10	0x20 → 0x7E for each byte	“”	1.10	Same value as the Point Tag of the Point Type the History Log Point resides in.
1	Parameter Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“”	1.10	User supplied text string used to identify the parameter being logged in the history point.
2	History Log Point	R/W	User	TLP	3	Any parameter may be logged except parameters of Data Type TLP or AC	{0,0,0}	1.10	TLP points to a value to be archived by history.
3	Archive Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines how the system archives a data point to history. Valid values are: 0 = None (History point not defined) 1 = User C/C++ Data 2 = User C/C++ Time 65 = FST Data History 67 = FST Time 128 = Average 129 = Accumulate 130 = Current Value 134 = Totalize
4	Averaging/Rate Type	R/W	User	UINT8	1	See note in description	0	1.10	Defines the rate of accumulation of the averaging technique and, in conjunction with the Archive Type parameter (3) further defines how the system archives history data. Accumulation Rate (Archive Type = 129): 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day Averaging Type (Archive Type = 128): 0 = None (History point not defined) 5 = Linear Averaging 6 = User Weighted Averaging (Ver 2.40)

Point Type 135: History Segment 10 Point

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Current value of parameter being logged.
6	Last Daily Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Value logged to the daily archive at the last contract hour.
7	Today Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached today.
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed today.
9	Today Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached today.
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed today.
11	Yesterday Minimum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the minimum value was reached yesterday.
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Minimum value of logged parameter observed yesterday.
13	Yesterday Maximum Time	R/O	System	TIME	4	0→4294967296	0	1.10	Time the maximum value was reached yesterday.
14	Yesterday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	1.10	Maximum value of logged parameter observed yesterday.

3.4.57 Point Type 136: ROC Clock

Description: Point type 136 provides parameters to configure the ROC real-time clock time and date.

Number of Logical Points: One logical point for ROC clock may exist.

Storage Location: Point type 136 is **not** saved to internal configuration memory.

Note: If you manually change the clock past the start or end time, the time is not adjusted. If power is not applied during the start or end time, the time adjusts on power-up.

Table 3-58: Point Type 136, ROC Clock

Point Type 136, ROC Clock

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Seconds	R/O	System	UINT8	1	0 – 59	0	1.10	The seconds.
1	Minutes	R/O	System	UINT8	1	0 – 59	0	1.10	The minutes.
2	Hours	R/O	System	UINT8	1	0 – 23	0	1.10	The hours.
3	Day	R/O	System	UINT8	1	1 – 31	1	1.10	The day.
4	Month	R/O	System	UINT8	1	1 – 12	1	1.10	The month.
5	Year	R/O	System	UINT16	2	2000 – 2104	2000	1.10	The year.
6	Day of Week	R/O	System	UINT8	1	1 – 7	7	1.10	The day of the week. 1 = Sunday 2 = Monday 3 = Tuesday 4 = Wednesday 5 = Thursday 6 = Friday 7 = Saturday
7	Time	R/O	System	TIME	4	N/A	0	1.10	Number of seconds elapsed since 12:00 a.m. Jan. 1, 1970.
8	Daylight Savings Time Enable	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates if daylight savings time is enabled. Valid values are: 0 = Disabled 1 = Enabled
9	Microseconds	R/O	System	UINT32	4	0 - 999999	0	1.10	The microseconds.
10	DST Start Hour	R/W	User	UINT8	1	1 → 23	2	1.20	Hour at which daylight saving time begins.
11	DST Start Day of Week	R/W	User	UINT8	1	1 → 7 (corresponds to Sunday through Saturday)	1	1.20	Day of the week on which daylight saving time begins.

Point Type 136, ROC Clock

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
12	DST Start Week of Month	R/W	User	UINT8	1	1 → 6 (if set to 6, is the last week of the month)-	2	1.20	Week of the month in which daylight saving time begins. Weeks are counted if the Sunday falls in the month,.
13	DST Start Month	R/W	User	UINT8	1	1 → 12	3	1.20	Month in which daylight saving time begins.
14	DST Start Date and Time	R/O	User	TIME	4	N/A	(based on above)	1.20	Time and date on which daylight saving time starts. Calculated based on the above settings.
15	DST End Hour	R/W	User	UINT8	1	0 → 23	2	1.20	Hour at which daylight saving time ends.
16	DST End Day of Week	R/W	User	UINT8	1	1 → 7 (corresponds to Sunday through Saturday)-	1	1.20	Day of the week on which daylight saving time ends.
17	DST End Week of Month	R/W	User	UINT8	1	1 → 5 (if set to 5, is the last week of the month)-	1	1.20	Week of the month in which daylight saving time ends. Weeks are counted if the Sunday falls in the month.
18	DST End Month	R/W	User	UINT8	1	1 → 12	11	1.20	Month in which daylight saving time ends.
19	DST End Date and Time	R/O	User	TIME	4	N/A	(based on above	1.20	Time and date on which daylight saving time ends. Calculated based on the above settings.

3.4.58 Point Type 137: Internet Configuration Parameters

Description: Point type 137 provides parameters to configuration data for internet communications.

Number of Logical Points: One logical point for Internet Configuration Parameters may exist.

Storage Location: Point type 137 is saved to internal configuration memory.

Table 3-59: Point Type 137, Internet Configuration Parameters

Point Type 137: Internet Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	MAC Address	R/O	System	AC12	12	N/A	Varies	1.10	Unique MAC address set by the factory.
1	IP Address	R/W	User	AC20	20	Must be in format XXX.XXX.XXX.XXX (such as 10.0.0.1).	10.0.0.2	1.10	IP Address for the ROC unit. **Note**: 255.255.255.255 is invalid.
2	Subnet Mask	R/W	User	AC20	20	Must be in format XXX.XXX.XXX.XXX (such as 10.0.0.1).	255.255.255.0	1.10	Subnet Mask for the ROC unit **Note**: 255.255.255.255 is invalid.
3	Gateway Address	R/W	User	AC20	20	Must be in format XXX.XXX.XXX.XXX (such as 10.0.0.1).	10.0.0.1	1.10	Gateway used by the ROC unit. **Note**: 255.255.255.255 is invalid.
4	ROC Plus Protocol IP Port Number	R/W	User	UINT16	2	0 → 65535	4000	1.10	The IP port number that the ROC will listen on for Roc Plus Protocol connections.
5	Current Roc Plus Protocol Connections	R/O	System	UINT8	1	0 → 255	0	1.10	This parameter shows the number of active Roc Plus Protocol TCP/IP connections.
6	Roc Plus Protocol Inactivity Time	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	3600.0	1.10	Time, in seconds, that the ROC800-Series will wait, without receiving a valid message, before it closes the connection. 0 disables. Occurs in the Application Layer.
7	Reset Roc Plus Protocol Connections	R/W	User	UINT8	1	0→1	0	1.10	Writing a 1 to this parameter will close all ROC Plus Protocol TCP/IP connections.
8	Roc Plus Protocol Keep-Alive Time	R/W	User	UINT32	4	0,64 → 86400	324	1.10	Specifies the amount of idle time (in seconds) before the first keep alive message is sent. Nine more keep-alive messages will be sent at an interval of 64 seconds before a connection is considered broken. Occurs in the Transport Layer. 0 disables
9	Modbus IP Port Number	R/W	User	UINT16	2	0 → 65535	502	1.10	The IP port number that the ROC will listen on for modbus connections.

Point Type 137: Internet Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
10	Current Modbus Connections	R/O	System	UINT16	2	0 → 65535	0	1.10	This parameter shows the number of active modbus TCP/IP connections.
11	Modbus Inactivity Time	R/W	User	FL	4	0.0→Any positive valid IEEE 754 float	3600.0	1.10	Time, in seconds, that the ROC800-Series will wait, without receiving a valid modbus message, before it closes the connection. 0 disables. Occurs in the Application Layer.
12	Reset Modbus Connections	R/W	User	UINT8	1	0→1	0	1.10	Writing a 1 to this parameter closes all Modbus TCP/IP connections.
13	Modbus Keep-Alive Time	R/W	User	UINT32	4	0,64 → 86400	324	1.10	Specifies the amount of idle time (in seconds) before the first keep-alive message is sent for the modbus connection. Nine more keep-alive messages will be sent at an interval of 64 seconds before a connection is considered broken. Occurs in the Transport Layer. 0 disables
14	Modbus over TCP Address To Use	R/W	User	UINT8	1	0 → 2	2	1.10	Selects which address (roc address or modbus over IP slave address) modbus over IP should use. Valid values are: 0 = Roc Address (TLP: 91,0,0) 1 = Modbus over IP Slave Address (TLP: 138,0,15) 2 = Either Roc Address or Modbus TCP Address
15	Modbus over TCP Slave Address	R/W	User	UINT8	1	0 → 255	0	1.10	Specifies the slave address for Modbus over IP
16	ARP Protection Enable	R/W	User	UINT8	1	0 → 1	0	2.20	Enables ARP storm protection. Valid values are 0 (Disable) and 1 (Enable).
17	ARP Packet Queue Limit	R/W	User	UINT32	4	0 → 65535	500	2.2o	Specifies the required number of ARP packets to be queued in order for the DL8000 to shut down the Ethernet device due to an ARP storm.
18	Modbus Master TCP Option	R/W	User	UINT8	1	0 → 1	0	2.20	Specifies the Modbus master TCP option for Master Table 1. Valid values are **0** (TCP Modbus format) and **1** (Modbus wrapped in TCP).
19	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 1
20	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 1
21	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 2
22	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 2
23	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 3
24	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 3

Point Type 137: Internet Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
25	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 4
26	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 4
27	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 5
28	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 5
29	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 6
30	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 6
31	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 7
32	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 7
33	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 8
34	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 8
35	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 9
36	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 9
37	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 10
38	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 10
39	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 11
40	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 11
41	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 12
42	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 12
43	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 13
44	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 13
45	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 14
46	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 14
47	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 15
48	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 15
49	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 16
50	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 16
51	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 17
52	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 17
53	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 18
54	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 18
55	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 19
56	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 19
57	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 20

Point Type 137: Internet Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
58	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 20
59	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 21
60	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 21
61	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 22
62	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 22
63	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 23
64	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 23
65	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 24
66	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 24
67	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 1, Server 25
68	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 1, Server 25
69	Modbus Master TCP Option	R/W	User	UINT8	1	0 → 1	0	2.20	Specifies the Modbus Master TCP option for Master Table 2. Valid values are 0 (TCP Modbus format) and 1 (Modbus wrapped in TCP)
70	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 1
71	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 1
72	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 2
73	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 2
74	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 3
75	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 3
76	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 4
77	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 4
78	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 5
79	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 5
80	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 6
81	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 6
82	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 7
83	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 7
84	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 8
85	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 8
86	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 9
87	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 9
88	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 10

Point Type 137: Internet Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
89	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 10
90	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 11
91	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 11
92	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 12
93	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 12
94	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 13
95	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 13
96	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 14
97	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 14
98	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 15
99	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 15
100	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 16
101	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 16
102	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 17
103	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 17
104	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 18
105	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 18
106	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 19
107	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 19
108	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 20
109	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 20
110	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 21
111	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 21
112	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 22
113	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 22
114	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 23
115	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 23
116	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 24
117	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 24
118	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 2, Server 25
119	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 2, Server 25
120	Modbus Master TCP Option	R/W	User	UINT8	1	0 → 1	0	2.20	Specifies the Modbus Master TCP option for Master Table 3. Valid values are 0 (TCP Modbus format) and 1 (Modbus wrapped in

Point Type 137: Internet Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
									TCP)
121	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 1
122	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 1
123	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 2
124	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 2
125	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 3
126	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 3
127	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 4
128	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 4
129	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 5
130	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 5
131	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 6
132	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 6
133	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 7
134	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 7
135	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 8
136	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 8
137	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 9
138	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 9
139	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 10
140	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 10
141	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 11
142	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 11
143	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 12
144	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 12
145	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 13
146	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 13
147	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 14
148	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 14
149	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 15
150	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 15
151	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 16
152	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 16

Point Type 137: Internet Configuration Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
153	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 17
154	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 17
155	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 18
156	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 18
157	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 19
158	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 19
159	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 20
160	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 20
161	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 21
162	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 21
163	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 22
164	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 22
165	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 23
166	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 23
167	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 24
168	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 24
169	IP Address	R/W	User	UINT32	4	N/A	0	2.20	IP address for Table 3, Server 25
170	IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	IP port number for Table 3, Server 25
171	Modbus Master TCP Connection Timeout	R/W	User	UINT8	1	0 → 255	0	2.20	Sets the number of seconds to wait for a successful connection.
172	Test IP Address	R/W	User	UINT32	4	N/A	0	2.2-	Indicates the IP address to use when testing a connection.
173	Test IP Port	R/W	User	UINT16	2	0 → 65535	0	2.20	Indicates the IP port to use when testing a connection.
174	Test IP Start	R/W	User	UINT16	2	0 → 1	0	2.20	Indicates when to test the IP connection. Valid values are 0 (Test connection complete/nothing) and 1 (Start connection test)
175	Test IP Status	R/O	System	UINT8	1	0 → 3	0	2.20	Indicates the statuys of the test connection, Valid values are: 0 = Success 1 = In Progress 2 = Failed 3 = Busy

3.4.59 Point Type 138: User C++ Host Parameters

Description: Point type 138 provides parameters with respect to hosting User C++ applications.

Number of Logical Points: One logical point for User C++ Host Parameters may exist.

Storage Location: Point type 138 is **not** saved to internal configuration memory.

Table 3-60: Point Type 138, User C++ Host Parameters

Point Type 138: User C++ Host Parameters

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Host Library Version	R/O	System	AC	12	0x20 → 0x7E for each byte	varies	1.10	The library version supported by the ROC.
1	Host SRAM Used	R/O	System	UINT32	4	0 → 0xFFFFFFFF	varies	1.10	The amount of SRAM consumed by User Defined Points.
2	Host SRAM Free	R/O	System	UINT32	4	0 → 0xFFFFFFFF	varies	1.10	The amount of SRAM available for User Defined Points.
3	Host DRAM Used	R/O	System	UINT32	4	0 → 0xFFFFFFFF	varies	1.10	The amount of DRAM consumed by User C++ Programs.
4	Host DRAM Free	R/O	System	UINT32	4	0 → 0xFFFFFFFF	varies	1.10	The amount of DRAM available for User C++ Programs.

3.4.60 Point Type 139: Smart I/O Module Information

Description: Point type 139 contains information for smart I/O modules.

Number of Logical Points: There are a maximum of 27 logicals (0→26). One logical for each I/O slot will exist.

Storage Location: Point type 139 is **not** saved to internal configuration memory.

Table 3-61: Point Type 139, Smart I/O Module Information

Point Type 139: Smart I/O Module Information

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Module Type	R/O	System	UINT8	1	0 → 3, 26, 28, 30, 33, 34, 50	0	1.10	Indicates the type of module. Valid values are: 0 = No Module 1 = AC I/O 2 = PI 4 Point 3 = APM 26 = Smart MVS 27 = Application module 28 = RTD 3-Point 30 = DO Relay 6-Point 33 = HART-2 module 34 = Thermocouple 4-Point 36 = IEC 62591 module 43 = Network Radio Module 50 = Unknown Auxiliary I/O module
1	System Mode	R/O	System	UINT8	1	0 → 1	0	1.10	States the run mode of the module. Valid values are: 0 = Run Mode 1 = Boot Mode – Extremely limited functionality is available 2 = Module Failure **Note**: If in Boot Mode then only parameters 0 – 4, 8,9 are valid.
2	Board Health	R/O	System	UINT8	1	0 → 2	1	1. 10	Indicates the health of the module. Valid values are: 0 = OK 1 = Module not Installed 2 = Communications lost
3	Boot Version	R/O	System	AC	10	0x20 → 0x7E for each byte	'y.yy'	1. 10	Software Version of Boot Image

Point Type 139: Smart I/O Module Information

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
4	Boot Part Number	R/O	System	AC	20	0x20 → 0x7E for each byte	'W68xxx'	1. 10	Part number of boot firmware
5	Boot Build Date	R/O	System	AC	20	0x20 → 0x7E for each byte	'mmm dd, yyyy HH:MM'	1. 10	The time and date stamp the boot firmware was created.
6	Flash Version	R/O	System	AC	10	0x20 → 0x7E for each byte	'y.yy'	1. 10	Software Version of Flash Image
7	Flash Part Number	R/O	System	AC	20	0x20 → 0x7E for each byte	'W68xxx'	1. 10	Part number off flash firmware
8	Flash Build Date	R/O	System	AC	20	0x20 → 0x7E for each byte	'mmm dd, yyyy HH:MM'	1. 10	The time and date stamp the flash firmware was created.
9	Module Specific Data	R/O	System	AC	20	0x20 → 0x7E for each byte	' '	1. 10	General data that is specific for each module type.
10	Serial Number	R/O	System	AC	30	0x20 → 0x7E for each byte	' '	1. 10	Serial Number
11	Flash Description	R/O	System	AC	20	0x20 → 0x7E for each byte	' '	2.02	Description that is specific for each module type
12	Module Specific Parameter #1	R/W	User	UINT32	4	0 → 4,294,967,296	SAM 0 IEC62591 36863	2.20	Indicates, for smart application modules, the module sub-type (1.10). Valid values are **0** (No Sub Type) and **10** (Modbus Master Sub Type). For the IEC 62591 module (V2.30): Bits 0-15: Network ID Bits 16-31: Unused
13	Module Specific Parameter #2	R/W	User	UINT32	4	0 → 4,294,967,296	SAM 0 IEC62591 0x44555354	2.20	Indicates, for smart application modules, the module conflict sub state. The system sets this value then the module health is module conflict (1.10). Valid values are: 0 = No conflict 1 = Too many application modules (max of 3) 2 = Duplication application modules installed (only one of each application module sub-type allowed) 3 = Display conflict (a user display or User C display is already loaded into a display slot used by the smart application module) IEC 62591 Join Key (bytes 0 → 3)(V2.30)
14	Module Specific Parameter #3	R/W	User	UINT32	4	0 → 4,294,967,296	0x4E455457	2.30	IEC 62591 Join Key (bytes 4 → 7)(V2.30)
15	Module Specific Parameter #4	R/W	User	UINT32	4	0 → 4,294,967,296	0x4F524B53	2.30	IEC 62591 Join Key (bytes 8 → 11)(V2.30)
16	Module Specific Parameter #5	R/W	User	UINT32	4	0 → 4,294,967,296	0x524F434B	2.30	IEC 62591 Join Key (bytes 12 → 15)(V2.30)

Point Type 139: Smart I/O Module Information

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
17	Module Specific Parameter #6	R/W	System	UINT32	4	0 → 4,294,967,296	0	2.30	IEC 62591 Status (V2.30) Status: Bit 7:1 -= Radio Failure Bit 6: 1 = Server Failure State Bit s 0-5: 0 = Initializing 1 = Detecting Radio 2 = Settting Network Configuration 3 = Waiting to Join Network 4 = Online Bits 8-31: Unused This is R/O: A write does not return an error but is ignored. :
18	Module Specific Parameter #7	R/W	System	UINT32	4	0 → 4,294,967,296		2.30	IEC 62591 Interface ID (V2.30) Bits 0-31: Interface ID This is R/O: A write does not return an error but is ignored. :
19	Module Specific Parameter #8	R/W	System	UINT32	4	0 → 4,294,967,296		2.30	IEC 62591 Interface Type (V2.30) Bits 0-15: Interface Type Bits 16-31: Unused This is R/O: A write does not return an error but is ignored.
20	Module Specific Parameter #9	R/W	System	UINT32	4	0 → 4,294,967,296 (1,2)	0	2.40	Network Radio Module (Ver 1.30) Start Auto Discovery sequence. 0 = Idle 1 = Start 2 = Stop. **Note**: The ROC800 automatically clears this parameter after the Auto Discovery Sequence completes.
21	Module Specific Parameter #10	R/W	System	UINT32	4	0 → 4,294,967,296 (not user writeable)	0	2.40	Network Radio Module (Ver 1.30) Radio Address
22	Module Specific Parameter #11	R/W	User	UINT32	4	0 → 4,294,967,296 (1)	0	2.40	Network Radio Module (Ver 1.30) Initialize Network Import and Export List. 0 = Idle 1 = Initialize **Note**: The ROC800 automatically clears this parameter.

Point Type 139: Smart I/O Module Information

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
23	Module Specific Parameter #12	R/W	System	UINT32	4	0 → 4,294,967,296 (not user writeable)	0	2.40	Network Radio Module (Ver 1.30) Network Status: 0 = Initializing 1 = Not Joined to Network 2 = Joined to Network – not commissioned 3 = Joined to Network and commissioned 128 = Radio Failure 129 = Invalid Network Configurator
24	Module Specific Parameter #13	R/W	User	UINT32	4	0 → 4,294,967,296 (1)	0	2.40	Network Radio Module (Ver 1.30) Force Time Synchronization 0 = Idle 1 = Force Time Sync
25	Module Specific Parameter #14	R/W	System	UINT32	4	0 → 4,294,967,296 (1)		2.40	Network Radio Module (Ver 1.30) Radio Address of the NRM
26	Module Specific Parameter #15	R/W	User	UINT32	4	0 → 4,294,967,296 (1)	0	2.40	Network Radio Module (Ver 1.30) Passthru Lock Address Bits 16-31 = Reserved Bits 8-15 = Address Bits 0-7 = Group
27	Module Specific Parameter #16	R/W	User	UINT32	4	0->4,294,967,296	0	2.41	Network Radio Module (v3.61) Stale Data Timeout in seconds (valid range is 10-3600)
28	Module Specific Parameter #17	R/W	User	UINT32	4	0->4,294,967,296	0	2.43	Network Radio Module (v3.70) Encryption Key 1
29	Module Specific Parameter #18	R/W	User	UINT32	4	0->4,294,967,296	0	2.43	Network Radio Module (v3.70) Encryption Key 2
30	Module Specific Parameter #19	R/W	User	UINT32	4	0->4,294,967,296	0	2.43	Network Radio Module (v3.70) Encryption Key 3
31	Module Specific Parameter #20	R/W	User	UINT32	4	0->4,294,967,296	0	2.43	Network Radio Module (v3.70) Encryption Key 4
32	Module Specific Parameter #21	R/W	User	UINT32	4	0->4,294,967,296	0	2.43	Network Radio Module (v3.70) Encryption Key 5
33	Module Specific Parameter #22	R/W	User	UINT32	4	0->4,294,967,296	0	2.43	Network Radio Module (v3.70) Encryption Key 6
34	Module Specific Parameter #23	R/W	User	UINT32	4	0->4,294,967,296	0	2.43	Network Radio Module (v3.70) Encryption Key 7
35	Module Specific Parameter #24	R/W	User	UINT32	4	0->4,294,967,296	0	2.43	Network Radio Module (v3.70) Encryption Key 8

3.4.61 Point Type 140: Alternating Current Input / Output

Description: Point type 140 provides parameters for controlling and accessing an AC input/output.

Number of Logical Points: 6 logicals per installed module.

Storage Location: Point type 140 is saved to internal configuration memory.

Table 3-62: Point Type 140, Alternating Current Input / Output

Point Type 140: AC I/O Point Type

Param#	Name	Abbr.	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id.	TAG	R/W	User	AC	10	0x20→0x7E for each ASCII character	"ACIO"	1.10	A 10 character description of the channel
1	Power In	PWRIN	R/O	System	UINT8	1	0→1	0	1.10	Module power indicator – same for every channel. 0 = AC power off, 1 = AC power detected
2	Channel Mode	MODE	R/O	System	UINT8	1	0→1	0	1.10	Channel mode is set via hardware dipswitch. 0 = channel set as input, 1 = channel set as output
3	Scanning Input	SCANIN	R/W	User	UINT8	1	0 → 1	1	1.10	If disabled, field inputs are ignored and no changes will occur unless manually entered. 0 = Disabled, 1 = Enabled. (Parameter functions the same as "Scanning" in Point type 101)
4	Filter	FILTER	R/W	User	FL	4	0.00 → 43,200.0	0.3	1.10	Number of seconds that an DI must remain in the ON state before it is recognized as valid and the Status (parameter #5) is changed. (Parameter functions the same as "Filter" in Point type 101)
5	Status Input	STATIN	R/W	System	UINT8	1	0→1	0	1.10	Status Input indicates what state the DI is currently in. 0 = inactive, 1 = input signal (Parameter functions the same as "Status" in Point type 101)
6	Physical Input	PHYIN	R/O	System	UINT8	1	0 → 1	0	1.10	Indicates what state the hardware is currently in. 1 = On, 0 = OFF (Parameter functions the same as "Physical Status" in Point type 101)
7	Scan Period	SCANPR	R/W	User	FL	4	0.02→43,200.0	0.05	1.10	Scan Period in Seconds

Point Type 140: AC I/O Point Type

Param#	Name	Abbr.	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
							(Slots 1-3 827, 809) 0.05→43,200.0 (Slots 4-27 827)			Due to limitations on the ROC 827, slots 4-27 will have a lower limit of 50mS. All other slots (1-3, 809) will have a minimum limit of 20mS.
8	Actual Scan Time	SCAN	R/O	System	FL	4	0.0 → 43,200.0	0.0	1.10	Actual number of seconds between updates of the DI. (Parameter functions the same as “Actual Scan Time” in Point type 101)
9	Input Invert Mode	INVERTI	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, the field input will be inverted in the Status (parameter #5 – ON becomes OFF and vice-versa). 0 = Invert Status Disabled, 1 = Invert Status Enabled. (Parameter functions the same as “Invert Mode” in Point type 101)
10	Latch Mode	LATCH	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, then, on an active transition of the input, the Status (parameter #5) will change to ON and remain in the ON state until it is cleared manually. 0 = Latch Status Disabled, 1 = Latch Status Enabled. (Parameter functions the same as “Latch Mode” in Point type 101)
11	Input Accumulated Value	IACCUM	R/W	Both	UINT32	4	0 → 4,294,967,295	0	1.10	Number of times the Status (parameter #5) goes from OFF to ON. (Parameter functions the same as “Accumulated Value” in Point type 101)
12	Cumulative On Time	ONCTR	R/W	Both	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.10	Number of seconds when the Status (parameter #5) is in the ON state. (Parameter functions the same as “Cumulative On Time” in Point type 101)
13	Cumulative Off Time	OFFCTR	R/W	Both	FL	4	0.0→Any positive valid IEEE 754 float	0.0	1.10	Number of seconds when the Status (parameter #5) is in the OFF state. (Parameter functions the same as “Cumulative Off Time” in Point type 101)
14	Input Alarming	IALEN	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, alarms may be generated and sent to the Alarm Log. 0 = Disabled, 1 = Enabled. (Parameter functions the same as “Alarming” in Point type 101)
15	Input Alarm Code	IALMCODE	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.10	
15.0	Not Used				Bit 0			0		Not Used
15.1	Not Used				Bit 1			0		Not Used

Point Type 140: AC I/O Point Type

Param#	Name	Abbr.	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
15.2	Not Used				Bit 2			0		Not Used
15.3	Not Used				Bit 3			0		Not Used
15.4	Not Used				Bit 4			0		Not Used
15.5	Status On Alarm	IALARM5			Bit 5			0		If set, the Status (parameter #5 is ON. If clear, the Status (parameter #5) is OFF (Parameter functions the same as “Status On Alarm” in Point type 101)
15.6	Not Used				Bit 6			0		Not Used
15.7	Input Scanning Disabled Alarm	IALARM7			Bit 7			0		If set, the Scanning (parameter #3) has been disabled. If clear, the Scanning (parameter #3) has been set to Enable. (Parameter functions the same as “Scanning Disabled Alarm” in Point type 101)
16	Input SRBX on Clear	ISRBXC	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.10	Indicates a SRBX alarm is desired if an alarm condition clears. 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled. (Parameter functions the same as “SRBX on Clear” in Point type 101)
17	Input SRBX on Set	ISRBXS	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.10	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled. (Parameter functions the same as “SRBX on Clear“ in Point type 101)
18	Scanning Output	SCANOUT	R/W	User	UINT8	1	$0 \rightarrow 2$	1	1.10	If disabled, no changes to the output will occur. If in Manual, only the user can change the values of the DO. If in Automatic, anything can change the values of the DO. 0 = Disabled, 1 = Automatic , 2 = Manual (Parameter functions the same as “Scanning Mode” in Point type 102)
19	Auto Output	AOSTATUS	R/W	Both	UINT8	1	$0 \rightarrow 1$	0	1.10	Controls the state of the DO when Scanning (parameter #5) is in auto mode. In other words, the physical output gets this status when Scanning (parameter # 18) is set to Automatic. (Parameter functions the same as “Auto Output” in Point type 102) . 0 = Off, 1 = On
20	Manual Output	MANVAL	R/W	Both	UINT8	1	$0 \rightarrow 1$	0	1.10	Controls the state of the DO when Scanning (parameter #18) is in manual mode. In other words, the physical output gets this status

Point Type 140: AC I/O Point Type

Param#	Name	Abbr.	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
										when Scanning (parameter # 18) is set to Manual. 0 = Off, 1 = On (Parameter functions the same as "Manual Output" in Point type 102)
21	Failsafe Output	FAULTVAL	R/W	User	UINT8	1	0 → 1	0	1.10	The state the output will be placed in when the unit is started and the Failsafe on Reset Parameter (Parameter #24) = 1, Use Failsafe value on reset. 0 = Off, 1 = On (Parameter functions the same as "Failsafe Output" in Point type 102)
22	Physical Output	PHYOUT	R/O	System	UINT8	1	0 → 1	0	1.10	Indicates what state the DO is currently in. 0 = Off, 1 = On (Parameter functions the same as "Physical Output" in Point type 102)
23	Output Accumulated Value	OACCUM	R/W	Both	UINT32	4	0 → 4,294,967,295	0	1.10	Number of times the Physical Output (parameter #22) goes from OFF to ON. (Parameter functions the same as "Accumulated Value" in Point type 102)
24	Failsafe on Reset Mode	CLRONRS	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, the Status (parameter #19) will be set to the status indicated in 'Failsafe Output' (Parameter #21) on a restart of any kind. If disabled, the last Status before the restart will be used. 0 = Output Last Status on Reset, 1 = Use Failsafe value on Reset. (Parameter functions the same as "Failsafe on Reset" in Point type 102)
25	Momentary Mode	MOMODE	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, the Status (parameter #19) will be turned ON for the entered Time On (parameter #30) and then be turned OFF. 0 = Momentary Disabled, 1 = Momentary Enabled. (Parameter functions the same as "Momentary Mode" in Point type 102)
26	Momentary Active	MOACTIV	R/O	System	UINT8	1	0 → 1	0	1.10	Indicates that the DO currently has the Momentary ability active. 0 = Momentary Not Active, 1 = Momentary Active. (Parameter functions the same as

Point Type 140: AC I/O Point Type

Param#	Name	Abbr.	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
										"Momentary Active" in Point type 102)
27	Toggle Mode	TOGMODE	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, the Status (parameter #19) will be turned ON for the entered Time On (parameter #30) and then turned OFF for the same Time On. The Status will continue to cycle between the ON and OFF states. 0 = Toggle Disabled, 1 = Toggle Enabled. (Parameter functions the same as "Toggle Mode" in Point type 102)
28	Timed Discrete Output (TDO) Mode	TDOMODE	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, the Status (parameter #19) will be turned ON for a calculated Time On (parameter #30) based upon the entered EU Value (parameter #37). After the Time On has expired, the Status will be turned OFF and remain that way until a new EU Value is entered. 0 = TDO Disabled, 1 = TDO Enabled.
29	Invert Output Mode	INVERTO	R/W	User	UINT8	1	0 → 1	0	1.10	This parameter will invert the output of the ACIO channel. Specifically this allows to use TDO mode to keep a channel OFF for a set amount of time and then bringing this channel back ON. **Note: This will always invert the output; including the Failsafe Output.** 0 = Normal, 1 = Inverted
30	Time On	TIMEON	R/W	Both	FL	4	0.02→ 43,200.0	1.0	1.10	Number of seconds the Status (parameter #19) will be turned ON for if in Toggle, or Momentary Mode. (Parameter functions the same as "Time On" in Point type 102)
31	Cycle Time	CYCTIME	R/W	User	FL	4	>0.0 → 43,200.0	15.0	1.10	Number of seconds for when Toggle Mode (parameter #27) is selected. The Status (parameter #19) will be ON for the calculated Time On and off for an equal amount of time. (Parameter functions the same as "Cycle Time" in Point type 102)
32	Units Tag	UNITS	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"Percent"	1.10	Describes the units used by the Output Parameters. Values must be printable ASCII characters. (Parameter functions the same as "Units Tag" in Point type 102)
33	Low Reading Time	LOWRT	R/W	User	FL	4	0.0 → 43,200.0	3.0	1.10	Minimum number of seconds the calculated

Point Type 140: AC I/O Point Type

Param#	Name	Abbr.	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
										Time On (parameter #30) will be when the entered EU Value (parameter #37) is less than or equal to the entered Low Reading EU (parameter #35). (Parameter functions the same as "Low Reading TIme" in Point type 102)
34	High Reading Time	HIGHRT	R/W	User	FL	4	0.0 → 43,200.0	12.0	1.10	Maximum number of seconds the calculated Time On (parameter #30) will be when the entered EU Value (parameter #37) is greater than or equal to the entered High Reading EU (parameter #36). (Parameter functions the same as "High Reading Time" in Point type 102)
35	Low Reading EU	LOWREU	R/W	User	FL	4	Any valid IEEE 754 float	0.0	1.10	Minimum EU Value (parameter #37) possible. (Parameter functions the same as "Low Reading EU" in Point type 102)
36	High Reading EU	HIGHREU	R/W	User	FL	4	Any valid IEEE 754 float	100.0	1.10	Maximum EU Value (parameter #37) possible. (Parameter functions the same as "High Reading EU" in Point type 102)
37	EU Value	EUVAL	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	1.10	Value in Engineering Units. (Parameter functions the same as "EU Value" in Point type 102)
38	Inrush Time	INRUSH	R/W	User	FL	4	0.02 → 0.5	0.05	1.10	Number of seconds that the initial inrush current is allowed to exceed the hardware limiting circuit before de-energizing the circuit. If this time is exceeded, the Fault Reset (parameter #40) is set to 1, scanning is disabled for the channel and if alarming is set, the correct alarm bit will be set.
39	Holding Current	CURRNT	R/O	System	FL	4	0.0 → 43,200.0	0	1.10	Detected current present in the channel in mA.
40	Fault Reset	FLTRESET	R/W	Both	UINT8	1	0 → 1	0	1.10	This value will be set to 1 when Holding Current (parameter #39) is above 1500 mA for Inrush Time (parameter #38) seconds. This value will be set to 2 when a relay failure has been detected. The module will need to be serviced by the manufacturer to reset this value. When not set to 0 the Scanning output (parameter #18) will be disabled, an alarm (parameter #42.4) will be raised, and the channel relay will be de-energized.

Point Type 140: AC I/O Point Type

Param#	Name	Abbr.	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
										A user action is required to reset it to 0. The firmware will continually disable scanning as long as this has a value of 1. 0 = Reset, 1 = Fault, 2 = Failure
41	Output Alarming	OALEN	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, alarms may be generated and sent to the Alarm Log. 0 = Disabled, 1 = Enabled. (Parameter functions the same as “Alarming” in Point type 102)
42	Output Alarm Code	OALMCODE	R/O	System	BIN	1	0x00 → 0xFF	0x00	1.10	
42.0	Not Used				Bit 0			0		Not Used
42.1	Not Used				Bit 1			0		Not Used
42.2	Not Used				Bit 2			0		Not Used
42.3	Relay Failure Alarm	OALARM3			Bit 3			0		If set, a relay failure has been detected. This is a hardware failure and cannot be reset by software. This alarm cannot be disabled.
42.4	Fault Current Alarm	OALARM4			Bit 4			0		If set, the Fault Reset (parameter #33) has been set to Fault. If clear, the Fault Reset (parameter #33) has been set to Reset. This alarm cannot be disabled.
42.5	Scanning Manual Alarm	OALARM5			Bit 5			0		If set, the Scanning (parameter #5) has been set to Manual. If clear, the Scanning (parameter #5) has been set to either Disable or Automatic (Parameter functions the same as “Scanning Manual Alarm” in Point type 102)
42.6	Point Fail	OALARM 6			Bit 6			0		If set, the ACIO is reporting a malfunction. If clear, the ACIO is operating properly.
42.7	Output Scanning Disabled Alarm	OALARM7			Bit 7			0		If set, the Scanning (parameter #18) has been disabled. If clear, the Scanning (parameter #18) has been set to either Automatic or Manual. (Parameter functions the same as “Scanning Disabled Alarm” in Point type 102)
43	Output SRBX on Clear	OSRBXC	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates a SRBX alarm is desired if an alarm condition clears. 0 = SRBX on Clear Disabled, 1 = SRBX on Clear Enabled. (Parameter functions the same as “SRBX on Clear” in Point type 102)

Point Type 140: AC I/O Point Type

Param#	Name	Abbr.	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
44	Output SRBX on Set	OSRBXS	R/W	User	UINT8	1	$0 \rightarrow 1$	0	1.10	Indicates a SRBX alarm is desired if an alarm condition occurs. 0 = SRBX on Set Disabled, 1 = SRBX on Set Enabled. (Parameter functions the same as "SRBX on Clear" in Point type 102)
45	AC Frequency	ACFREQ	R/W	User	FL	4	$47 \rightarrow 63$	60	1.10	The frequency of the AC input. This parameter must be correct for fault detection to function properly.
46	Failure Action	FAILACT	R/W	User	UINT8	1	$0 \rightarrow 2$	0	1.10	This parameter dictates the action to be taken when a failure condition is detected. In all cases the Relay Failure Alarm bit (parameter #42.3) is set. 0 = Channel Shutdown, alarm logged 1 = No action taken, alarm logged 2 = No action taken, alarm not logged **WARNING**: Changing this parameter can disable relay protection.

3.4.62 Point Type 141: Advance Pulse Module

Description: Point type 141 provides parameters to configure the Advance Pulse module.

Number of Logical Points: 1 logical point per installed module.

Storage Location: Point type 141 is saved to internal configuration memory.

Table 3-63: Point Type 141, Advance Pulse Module

Point Type 141: Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id.	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	"APM Deflt"	1.10	A 10 character identification name for a specific APM. Values must be printable ASCII characters.
1	API Level Check Pair 1	R/W_CNDL	User	UINT8	1	0 → 4	4	1.10	The user can select which API level they wish to perform. The program writes the output of the API Chapter 5.5 level checks to the API Pulse Counts Pair 1 (parameter #17). Valid values are: 0 - Level A 1 - Level B 2 - Level C 3 - Level D 4 – Level E 5 – Marker Pulse
2	API Level Check Pair 2	R/W_CNDL	User	UINT8	1	1 → 4	4	1.10	The user can select which API level they wish to perform. The system writes the output of the API Chapter 5.5 level checks to the API Pulse Counts Pair 2 (parameter #19). Valid values are: 1 - Level B 2 - Level C 3 - Level D 4 – Level E 5 – Marker Pulse
3	Meter Input on Prove	R/W	User	UINT8	1	0 → 3	0	1.10	Indicates which pulse to use for the Meter Prove. 0 - Pulse Input 1 1 - Pulse Input 2 2 - Pulse Input 3 3 - Pulse Input 4

Point Type 141: Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
4	Master Meter Input on Prove	R/W	User	UINT8	1	0 → 3	2	1.10	Indicates which pulse to use for the Master Meter Prove. 0 - Pulse Input 1 1 - Pulse Input 2 2 - Pulse Input 3 3 - Pulse Input 4 **Note**: This is only valid if Software Detector Switch Enabled (parameter #42) is enabled.
5	Raw Pulse Count PI One	R/O	System	UINT32	4	0 → 16,000,000	0	1.10	The raw accumulated number of pulses for PI One
6	Frequency PI One	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.10	Frequency of incoming pulses on PI One in pulses/second.
7	Scan Period PI One	R/W_CNDL	User	FL	4	0.05 → 60.0	1.0	1.10	Time period in seconds in which the parameters associated with the pulse input are evaluated.
8	Raw Pulse Count PI Two	R/O	System	UINT32	4	0 → 16,000,000	0	1.10	The raw accumulated number of pulses for PI Two
9	Frequency PI Two	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.10	Frequency of incoming pulses on PI Two in pulses/second.
10	Scan Period PI Two	R/W_CNDL	User	FL	4	0.05 → 60.0	1.0	1.10	Time period in seconds in which the parameters associated with the pulse input are evaluated.
11	Raw Pulse Count PI Three	R/O	System	UINT32	4	0 → 16,000,000	0	1.10	The raw accumulated number of pulses for PI Three
12	Frequency PI Three	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.10	Frequency of incoming pulses on PI Three in pulses/second.
13	Scan Period PI Three	R/W_CNDL	User	FL	4	0.05 → 60.0	1.0	1.10	Time period in seconds in which the parameters associated with the pulse input are evaluated.
14	Raw Pulse Count PI Four	R/O	System	UINT32	4	0 → 16,000,000	0	1.10	The raw accumulated number of pulses for PI Four
15	Frequency PI Four	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.10	Frequency of incoming pulses on PI Four in pulses/second.
16	Scan Period PI Four	R/W_CNDL	User	FL	4	0.05 → 60.0	1.0	1.10	Time period in seconds in which the parameters associated with the pulse input are evaluated.
17	API Pulse Counts Pair 1	R/O	System	UINT32	4	0 → 16,000,000	0	1.10	The accumulated number of pulses through the API level checks for pulse pair 1. This will be updated only when the API Level Check Pair 1 (parameter #1) is set to either Level A, B, or C.
18	Frequency Pair 1	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.10	Frequency of incoming pulses on Pair One in pulses/second.
19	API Pulse Counts Pair 2	R/O	System	UINT32	4	0 → 16,000,000	0	1.10	The accumulated number of pulses through the API level checks for pulse pair 2. This will be updated only when the API Level Check Pair 2 (parameter #2) is set to either Level A, B, or C.

Point Type 141: Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
20	Frequency Pair 2	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.10	Frequency of incoming pulses on Pair Two in pulses/second.
21	Meter Whole Pulse Count	R/O	System	UINT32	4	0 → 16,000,000	0	1.10	Actual number of whole pulses accumulated between detector switches for a Meter Input (parameter #3). Note: Detector Reset will clear this value.
22	Master Meter Whole Pulse Count	R/O	System	UINT32	4	0 → 16,000,000	0	1.10	Actual number of whole pulses accumulated between detector switches for a Master Meter Input (parameter #4) **Note**: This is only valid if Software Detector Switch Enabled (parameter #42) is enabled. Detector Reset will clear this value.
23	Meter Interpolated Pulse Count	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.10	Actual Number of interpolated pulses accumulated between detector switches for a given meter pulse input.
24	Master Meter Interpolated Pulse Count	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	1.10	Actual Number of interpolated pulses accumulated between software detector switches for a given master meter pulse input.
25	PI Alarming	R/W	User	UINT8	1	0 → 1	0	1.10	Displays whether alarms may be generated and sent to the alarm log for a pulse input. Valid values are: 0 – Alarming Disabled 1 – Alarming Enabled
26	PI SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates an SRBX alarm is desired if an alarm condition clears for a pulse input. Valid values are: 0 – SRBX on Clear Disabled 1 – SRBX on Clear Enabled
27	PI SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates an SRBX alarm is desired if an alarm condition occurs for a pulse input. Valid values are: 0 – SRBX on Set Disabled 1 – SRBX on Set Enabled
28	API Pair 1 Alarm Status	R/O	System	BIN	1	0 → 255	0	1.10	API Level Alarm Status (Pair 1) **Note**: These are updated in real time
28.0	Sequence Out of Order Error			Bit 0			0		This alarm is present if the sequence of the pulses within the pair become out of order. Valid values are: 0 = No Alarm Present 1 = Alarm Present
28.1	Phase Discrepancy Detected			Bit 1			0		This alarm is present if the phase of the pulses within the pair becomes skewed. Valid values are: 0 = No Alarm Present 1 = Alarm Present

Point Type 141: Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
28.2	Pulse Synchronization Error			Bit 2			0		This alarm is present if the synchronization of the pulses fails. Valid values are: 0 = No Alarm Present 1 = Alarm Present
28.3	Frequency Discrepancy Detected			Bit 3			0		This alarm is present if the frequencies of the two pulses are not equal. Valid values are: 0 = No Alarm Present 1 = Alarm Present
28.4	PI 1 Failure			Bit 4			0		This alarm is present if PI 1 has failures (see bits 0-3). Valid values are: 0 = No Alarm Present 1 = Alarm Present
28.5	PI 2 Failure			Bit 5			0		This alarm is present if PI 2 has failures (see bits 0-3). Valid values are: 0 = No Alarm Present 1 = Alarm Present
28.6	Level A Bad Pulse Stream			Bit 6			0	2.20	This alarm is present if the number of bad pulses exceeds the bad pulse threshold in level A. A bad pulse is either a missing pulse or a duplicate pulse. Valid values are: 0 = No Alarm Present 1 = Alarm Present
28.7	Marker Pulse Alarm			Bit 7			0	2.20	This alarm is present if the flow pulses drift from the expected number of pulses by more than the marker pulse deadband for Pair 1. Valid values are: 0 = No Alarm Present 1 = Alarm Present
29	API Pair 2 Alarm Status	R/O	System	BIN	1	0 → 255	0	1.10	API Level Alarm Status (Pair 2) **Note**: These are updated in real time
29.0	Sequence Out of Order Error			Bit 0			0		This alarm is present if the sequence of the pulses within the pair become out of order. Valid values are: 0 = No Alarm Present 1 = Alarm Present
29.1	Phase Discrepancy Detected			Bit 1			0		This alarm is present if the phase of the pulses within the pair becomes skewed. Valid values are: 0 = No Alarm Present 1 = Alarm Present
29.2	Pulse Synchronization Error			Bit 2			0		This alarm is present if the synchronization of the pulses fails. Valid values are: 0 = No Alarm Present 1 = Alarm Present

Point Type 141: Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
29.3	Frequency Discrepancy Detected			Bit 3			0		This alarm is present if the frequencies of the two pulses are not equal. Valid values are: 0 = No Alarm Present 1 = Alarm Present
29.4	PI 3 Failure			Bit 4			0		This alarm is present if PI 3 has failures (see bits 0-3). Valid values are: 0 = No Alarm Present 1 = Alarm Present
29.5	PI 4 Failure			Bit 5			0		This alarm is present if PI 4 has failures (see bits 0-3). Valid values are: 0 = No Alarm Present 1 = Alarm Present
29.6	Not Used			Bit 6			0		Not Used
29.7	Marker Pulse Alarm			Bit 7			0	2.20	This alarm is present if the flow pulses drift from the expected number of pulses by more than the marker pulse deadband for Pair 2. Vaid values are: 0 = No Alarm Present 1 = Alarm Present
30	API Phase Alarm Count Pair 1	R/O	System	UINT16	2	0 → 65535	0	1.10	The total number of phase alarms
31	API Same Channel Alarm Count Pair 1	R/O	System	UINT16	2	0 → 65535	0	1.10	The total number of same channel alarms
32	API Phase Alarm Count Pair 2	R/O	System	UINT16	2	0 → 65535	0	1.10	The total number of phase alarms
33	API Same Channel Alarm Count Pair 2	R/O	System	UINT16	2	0 → 65535	0	1.10	The total number of same channel alarms
34	Detector Reset	R/W	User	UINT8	1	0 → 1	0	1.10	This essentially notifies the APM of the start of a prove. All accumulated pulse values shall be cleared. All alarms shall be cleared. Accumulation of pulses will start at the first detector switch transition and will stop at the 2nd detector switch transition. Valid values are: 0 = Idle 1 = Reset
35	Detector Switch 1 Status	R/O	System	UINT8	1	0 → 1	0	1.10	The physical detector switch status is either open or closed. Valid values are: 1 = Open 0 = Closed
36	Detector Switch 2 Status	R/O	System	UINT8	1	0 → 1	0	1.10	The physical detector switch status is either open or closed. Valid values are: 1 = Open 0 = Closed

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
37	Detector Switch State	R/O	System	UINT8	1	0 → 3	3	1.10	Gives the state of the detector switches. Valid values are: 0 = Reset, a reset has been received and the APM is expecting a detector switch transition. 1 =- Counting, a detector switch transition has occurred and the APM is currently counting whole pulses. 2 =- Complete, another detector switch transition has occurred and the Prove Run is complete. All values will be stored until the next reset. 3 = Invalid, the accumulator does not contain good values. This can be either at a power up or if we have lost communication during a prove and the accumulators have been reset to zero.
38	Flow Direction Pair 1	R/O	System	UINT8	1	0 → 1	0	1.10	This will give the direction of flow based on 180 degrees out of phase for first pair of pulses. Level A or B API checks must be used (parameter #1). Valid values are: 0 = Forward (< 180 degrees) 1 = Reverse (> 180 degrees) **Note**: Forward/Reverse designators assume 90 degrees out of phase
39	Flow Direction Pair 2	R/O	System	UINT8	1	0 → 1	0	1.10	This will give the direction of flow based on 180 degrees out of phase for the second pair of pulses. Level A or B API checks must be used (parameter #2) Valid values are: 0 = Forward (< 180 degrees) 1 = Reverse (> 180 degrees) **Note**: Forward/Reverse designators assume 90 degrees out of phase
40	Software Detector Switch	R/W	User	UINT8	1	0 → 1	0	1.10	A 1 “triggers” the start/stop of counting pulses for a master meter or tank prove. Once the APM receives a trigger, it will set this back to Idle. Valid values are: 0 = Idle 1 = Detector Switch Triggered **Note**: This is only valid if Software Detector Switch Enabled (parameter #42) is enabled.
41	Detector Switch Filter Time	R/W	User	UINT16	2	0 → 1500	300	1.10	This is the time allotted after a detector switch is triggered and before the next trigger is to occur. This shall provide a de-bounce filter for the detector switches. The time shall be given in milliseconds.

Point Type 141: Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
42	Software Detector Switch Enabled	R/W	User	UINT8	1	0 → 1	0	1.10	Displays whether a master meter or tank prover is to be proved. Valid values are: 0 = Disabled 1 = Enabled
43	PI4/PO Configuration	R/O	System	UINT8	1	0 → 1	1	1.10	Gives the configuration of the PI4/PO terminal of the APM. A hardware switch is used to configure this. Valid values are: 0 = Configured for a Pulse Input 1 = Configured for a Pulse Output
44	PO Scan Period	R/W_CNDL	User	FL	4	0, 0.500 → 43,200.0	1.0	1.10	Time period in seconds in which the parameters associated with the pulse output are evaluated. Enter **0** to disable this options. All other output pulses will be at a 50% duty cycle
45	Input TLP	R/W_CNDL	User	TLP	3		0,0,0	1.10	Input to be used in calculating output pulses
46	PO Input Mode	R/W_CNDL	User	UINT8	1	0 → 1	0	1.10	Gives the interpretation of the Input TLP (parameter #45). Valid values are: 0 = Input TLP is a rate 1 = Input TLP is an accumulation
47	PO Accumulator	R/O	System	UINT32	4	0 → 16,000,000	0	1.10	Gives the accumulated number of pulses sent out.
48	Output Scaling Value	R/W_CNDL	User	FL	4	Any positive IEEE 754 float, except 0.0	1.0	1.10	The value that is applied to the accumulated pulse value.
49	Buffer Warning Alarm Set Point	R/W_CNDL	User	UINT16	2	0 → 65535	500	1.10	The max buffered pulses allowed before the buffer warning alarm is triggered. **Note**: This must be less than the max buffered pulses allowed.
50	Maximum Buffered Pulses	R/W_CNDL	User	UINT16	2	0 → 65535	1000	1.10	The max buffered pulses allowed.
51	Maximum Pulse Output Frequency	R/W_CNDL	User	UINT16	2	0 → 12000	12000	1.10	The maximum number of pulses per second which can be output by the PO (in Hz). If the calculated number of pulses exceeds this value then those pulses shall be placed in the buffer.
52	PO Alarming	R/W	User	UINT8	1	0 → 1	0	1.10	Displays whether alarms may be generated and sent to the alarm log for a pulse output. Valid values are: 0 = Alarming Disabled 1 = Alarming Enabled
53	PO Alarm Code	R/O	System	BIN	1	0 → 255	0	1.10	Defines the alarms for a pulse output
53.0	Not Used			Bit 0					Not Used

Point Type 141: Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
53.1	Buffer Overrun Alarm			Bit 1					The number of buffered pulses has exceeded the max limit (parameter #50). Pulses are now being lost. Valid values are: 0 = No Alarm Present 1 = Alarm Present
53.2	Buffer Warning Alarm			Bit 2					The number of buffered pulses has reached the set point (parameter #49). The scaling factor should be adjusted so that pulses are not lost. Valid values are 0 = No Alarm Present 1 = Alarm Present
53.3	Not Used			Bit 3					Not Used
53.4	Not Used			Bit 4					Not Used
53.5	Not Used			Bit 5					Not Used
53.6	Not Used			Bit 6					Not Used
53.7	Not Used			Bit 7					Not Used
54	PO SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates an SRBX alarm is desired if an alarm condition clears for a pulse output. 0 – SRBX on Clear Disabled 1 – SRBX on Clear Enabled
55	PO SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates an SRBX alarm is desired if an alarm condition occurs for a pulse output. Valid values are 0 = SRBX on Set Disabled 1 = SRBX on Set Enabled
56	Alarming	R/W	User	UINT8	1	0 → 1	0	1.10	If enabled, alarms may be generated and sent to the Alarm Log. Valid values are: 0 = Disabled 1 = Enabled
57	Alarm Code	R/O	System	BIN	1	0 → 255	0	1. 10	Defines the alarms for the APM
57.0	Not Used			Bit 0					Not Used
57.1	Not Used			Bit 1					Not Used
57.2	Not Used			Bit 2					Not Used
57.3	Not Used			Bit 3					Not Used
57.4	Not Used			Bit 4					Not Used
57.5	Not Used			Bit 5					Not Used
57.6	Point Fail Alarm			Bit 6					If set, the APM is reporting a malfunction. If cleared, the APM is operating properly

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Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
57.7	Not Used			Bit 7					Not Used
58	SRBX on Set	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates an SRBX alarm is desired if an alarm condition occurs. Valid values are: 0 = Disable SRBX on Set 1 = Enable SRBX on Set
59	SRBX on Clear	R/W	User	UINT8	1	0 → 1	0	1.10	Indicates an SRBX alarm is desired if an alarm condition clears. Valid values are: 0 = Disable SRBX on Clear 1 = Enable SRBX on Clear
60 (Series 2)	API Reverse Pulse Counts Pair 1	R/O	System	UINT32	4	0 → 16,000,000	0	2.00	Indicates the accumulated number of reverse pulses through the API level checks for pulse pair 1. The system updates this value only when the API Level Check Pair 1 (parameter #1) is set to either Level B or C.
61 (Series 2)	API Reverse Pulse Counts Pair 2	R/O	System	UINT32	4	0 → 16,000,000	0	2.00	Indicates the accumulated number of reverse pulses through the API level checks for pulse pair 2. The system updates this value only when the API Level Check Pair 2 (parameter #2) is set to either Level B or C.
62 (Series2)	Pulse Input 1 Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"APM Default PI 1Tag"	2.00	A 20 character identification name for a specific APM Pulse Input. Values must be printable ASCII characters.
63 (Series2)	Pulse Input 2 Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"APM Default PI 2Tag"	2.00	A 20 character identification name for a specific APM Pulse Input. Values must be printable ASCII characters.
64 (Series2)	Pulse Input 3 Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"APM Default PI 3Tag"	2.00	A 20 character identification name for a specific APM Pulse Input. Values must be printable ASCII characters.
65 (Series2)	Pulse Input 4 Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	"APM Default PI 4Tag"	2.00	A 20 character identification name for a specific APM Pulse Input. Values must be printable ASCII characters.
66 (Series2)	Meter Interpolation Timer T1	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	2.00	Indicates the time interval, in seconds, over which the whole flowmeter pulses were accumulated.
67 (Series2)	Meter Interpolation Timer T2	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	2.00	Indicates the time interval, in seconds, between the first and second detector switch being triggered.
68 (Series2)	Master Meter Interpolation Timer T1	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	2.00	Indicates the time interval, in seconds, over which the whole flowmeter pulses were accumulated on the master meter.
69 (Series2)	Master Meter Interpolation Timer T2	R/O	System	FL	4	0 → Any positive IEEE 754 float	0.0	2.00	Indicates the time interval, in seconds, between the first and second detector switch being triggered for the master meter

Point Type 141: Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
70 (Series2)	API Forward Pulse Counts Pair 1	R/O	System	UINT32	4	0 → 16,000,000	0	2.00	Indicates the accumulated number of forward pulses through the API level checks for pulse pair 1. The system updates this value only when the API Level Check Pair 1 (parameter #1) is set to either Level B or C.
71 (Series2)	API Forward Pulse Counts Pair 2	R/O	System	UINT32	4	0 → 16,000,000	0	2.00	Indicates the accumulated number of forward pulses through the API level checks for pulse pair 2. The system updates this value only when the API Level Check Pair 2 (parameter #2) is set to either Level B or C.
72 (Series2)	API Total Alarm Count Pair 1	R/O	System	UINT32	4	0 → 4,294,967,295	0	2.20	Indicates the total number of alarms on pair 1.
73 (Series2)	API Bad Pulse Threshold Pair 1	R/W	User	UINT32	4	0 → 4,294,967,295	1	2.20	Indicates the number of bad pulse pairs received before setting the API Pair 1 alarm status whe using API Level A.
74 (Series2)	API Good Pulse Threshold Pair 1	R/W	User	UINT32	4	0 → 4,294,967,295	1	2.20	Indicates the number of good pulse pairs received before clearing the API Pair 1 alarm status when using API Level A.
75 (Series2)	API Low Frequency Cutoff Pair 1	R/W	User	FL	4	Any positive IEEE 754 float.	0	2.20	Sets the frequency below which the Pair 1 alarm status no longer sets. Existing alarms clear if the Pair 1 bad pulse reset mode is set to 1 (Clear) or the number of good pulse pairs received below the threshold is greater than the API good pulse threshold for Pair 1. **Note**: Applies only when using API Level A.
76 (Series2)	API Bad Pulse Reset Mode Pair 1	R/W	User	UINT8	1	0 → 1	0	2.20	Determines whether the system clears the number of bad pulse pairs (contributing towards the Pair 1 bad pulse threshold and the existing alarm bits) when the frequency falls below the low frequency cutoff for Pair 1. Valid values are 0 (Retain) and 1 (Clear). **Note**: Applies only when using API Level A.
77 (Series2)	Marker Pulse Alarm Deadband Pair 1	R/W	User	UINT16	2	0 → 65535	10	2.20	Indicates the allowed deviation of flow pulses from expected pulses at a marker pulse before setting the Marker Pulse Alarm bit. **Note**: Applies only when using Marker Pulse level checking.
78 (Series2)	Flow Pulses per Marker Pulse Pair 1	R/W	User	UINT16	2	0 → 65535	1000	2.20	Indicates the number of flow pulses expected between each marker pulse. **Note**: Applies only when using Marker Pulse level checking.

Point Type 141: Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
79 (Series2)	Flow Pulse Accumulation at Marker Pulse Pair 1	R/O	System	UINT32	4	0 → 16,000,000	0	2.20	Indicates the accumulation of flow pulses, updated when a marker pulse is received. **Note**: Applies only when using Marker Pulse level checking.
80 (Series2)	Flow Pulse Drift from Expected Pair 1	R/O	System	INT32	4	-2,147,483,648 → 2,147,483,647	0	2.20	Indicates the drift from expected flow pulse value, updated when a marker pulse is received. **Note**: Applies only when using Marker Pulse level checking.
81 (Series2)	Marker Pulse Reset Pair 1	R/W	Both	UINT8	1	0 → 1	0	2.20	Resets the flow pulse accumulation and flow pulse drift for Pair 1. Valid values are 0 (Idle) and 1 (Reset). **Note**: Applies only when using Marker Pulse level checking.
82 (Series2)	Marker Pulse Alarm Deadband Pair 2	R/W	User	UINT16	2	0 → 65535	10	2.20	Indicates the allowed deviation of flow pulses from expected pulses at a marker pulse before setting the Marker Pulse Alarm bit. **Note**: Applies only when using Marker Pulse level checking.
83 (Series2)	Flow Pulses per Marker Pulse Pair 2	R/W	User	UINT16	2	0 → 65535	1000	2.20	Indicates the number of flow pulses expected between each marker pulse. **Note**: Applies only when using Marker Pulse level checking
84 (Series2)	Flow Pulse Accumulation at Marker Pulse Pair 2	R/O	System	UINT32	4	0 → 16,000,000	0	2.20	Indicates the accumulation of flow pulses, updated when a marker pulse is received. **Note**: Applies only when using Marker Pulse level checking.
85 (Series2)	Flow Pulse Drift from Expected Pair 2	R/O	System	INT32	4	-2,147,483,648 → 2,147,483,647	0	2.20	Indicates the drift from expected flow pulse value, updated when a marker pulse is received. **Note**: Applies only when using Marker Pulse level checking.
86 (Series2)	Marker Pulse Reset Pair 2	R/W	Both	UINT8	1	0 → 1	0	2.20	Resets the flow pulse accumulation and flow pulse drift for Pair 1. Valid values are 0 (Idle) and 1 (Reset). **Note**: Applies only when using Marker Pulse level checking.
87	Contract Hour	R/W	User	UINT8	1	0 → 23	0	2.40	Hour, in 24-hour format, that represents the end of the day for the APM PIs
88	Current Rate Period	R/W	User	UNIT8	1	0 → 3	2	2.40	Detemines the calculation of the current rate (parameters 105 through 108). Valid values are: 0 = EU/second 1 = EU/minute 2 = EU/hour 3 = EU/day

Point Type 141: Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
89	Pulse Input 1 Units Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	‘ “	2.40	Indicates the units used by PI1. Values must be printable ASCII characters.
90	Pulse Input 2 Units Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	‘ “	2.40	Indicates the units used by PI2. Values must be printable ASCII characters.
91	Pulse Input 3 Units Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	‘ “	2.40	Indicates the units used by PI3. Values must be printable ASCII characters.
92	Pulse Input 4 Units Tag	R/W	User	AC	20	0x20 → 0x7E for each ASCII character	‘ “	2.40	Indicates the units used by PI4. Values must be printable ASCII characters.
93	Pulse Input 1 Pulses for Day	R/O	Both	UINT332	4	0 → 4,294,967,295	0	2.40	Total number of pulses PI1 has received for the contract day.
94	Pulse Input 2 Pulses for Day	R/O	Both	UNIT32	4	0 → 4,294,967,295	0	2.40	Total number of pulses PI2 has received for the contract day.
95	Pulse Input 3 Pulses for Day	R/O	Both	UINT32	4	0 → 4,294,967,295	0	2.40	Total number of pulses PI3 has received for the contract day.
96	Pulse Input 4 Pulses for Day	R/O	Both	UNIT32	4	0 → 4,294,967,295	0	2.40	Total number of pulses PI4 has received for the contract day.
97	Pulse Input 1 EU Today	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	2.40	Accumulated value in Engineering Units for this contract hour on PI1. Calculated using the conversion value for this PI and based on Pulses/EU.
98	Pulse Input 2 EU Today	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	2.40	Accumulated value in Engineering Units for this contract hour on PI2. Calculated using the conversion value for this PI and based on Pulses/EU.
99	Pulse Input 3 EU Today	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	2.40	Accumulated value in Engineering Units for this contract hour on PI3. Calculated using the conversion value for this PI and based on Pulses/EU.
100	Pulse Input 4 EU Today	R/W	Both	FL	4	Any valid IEEE 754 float	0.0	2.40	Accumulated value in Engineering Units for this contract hour on PI4. Calculated using the conversion value for this PI and based on Pulses/EU.
101	Pulse Input 1 EU Yesterday	R/O	System	FL	4	Any valid IEEE 754 float	0.0	2.40	Previous contract day’s EU total for PI1.
102	Pulse Input 2 EU Yesterday	R/O	System	FL	4	Any valid IEEE 754 float	0.0	2.40	Previous contract day’s EU total for PI2.
103	Pulse Input 3 EU Yesterday	R/O	System	FL	4	Any valid IEEE 754 float	0.0	2.40	Previous contract day’s EU total for PI3.
104	Pulse Input 4 EU Yesterday	R/O	System	FL	4	Any valid IEEE 754 float	0.0	2.40	Previous contract day’s EU total for PI4.

Point Type 141: Advanced Pulse Module

Param#	Name	Access	System or User Update	Data Type	Lengt h	Range	Default	Ver	Description of functionality and meaning of values
105	Pulse Input 1 EU Rate	R/O	System	FL	4	Any valid IEEE 754 float	0.0	2.40	Calculated rate of the pulses for PI1. Based upon the EU value and the Rate Period for the module (parameter 88)
106	Pulse Input 2 EU Rate	R/O	System	FL	4	Any valid IEEE 754 float	0.0	2.40	Calculated rate of the pulses for PI2. Based upon the EU value and the Rate Period for the module (parameter 88)
107	Pulse Input 3 EU Rate	R/O	System	FL	4	Any valid IEEE 754 float	0.0	2.40	Calculated rate of the pulses for PI3. Based upon the EU value and the Rate Period for the module (parameter 88)
108	Pulse Input 4 EU Rate	R/O	System	FL	4	Any valid IEEE 754 float	0.0	2.40	Calculated rate of the pulses for PI4 Based upon the EU value and the Rate Period for the module (parameter 88)
109	Pulse Input 1 Conversion Rate	R/O	User	FL	4	Any valid IEEE 754 float except 0.0	1.0	2.40	Used to calculate the units of the EU values for PI1.
110	Pulse Input 2 Conversion Rate	R/W	User	FL	4	Any valid IEEE 754 float except 0.0	1.0	2.40	Used to calculate the units of the EU values for PI2.
111	Pulse Input 3 Conversion Rate	R/W	User	Fl	4	Any valid IEEE 754 float except 0.0	1.0	2.40	Used to calculate the units of the EU values for PI3.
112	Pulse Input 4 Conversion Rate	R/W	User	FL	4	Any valid IEEE 754 float except 0.0	1.0	2.40	Used to calculate the units of the EU values for PI4.

3.4.63 Point Type 142: History Segment 11 Point Configuration

Description: Point type 142 provides parameters to configure History Segment 11.

Number of Logical Points: Varies, depending on the segment size parameter for History Segment 11

Storage Location: Point type 142 is saved to internal configuration memory.

Table 3-64: Point Type 142, History Segment 11

Point Type 142: History Segment 11

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id.	R/O	User	AC	10	0x20 → 0x7E for each byte	"-"	2.00	A 10 character identification name for a specific APM. Values must be printable ASCII characters.
1	Parameter description	R/W	User	AC	10	0x20 → 0x7E for each byte	"-"	2.00	Idenitfies the parameter being logged in the history point.
2	History Point Log	R/W	User	TLP	3	Any parameter with the exception of data types TLP or AC	0,0,0	2.00	Indicates the value to be archived.
3	Archive Type	R/W	User	UINT8	1	See Description	0	2.00	Defines how the system archives the data point to history. Valid values are: 0 = None (history point not defined) 1 = User C/C++ data (ver 1.20) 2 = User C/C++ time (ver 1.20) 65 = FST data history 67 = FST time 128 = Average 129 = Accumulated 130 = Currentl Value 134 = Totalize

Point Type 142: History Segment 11

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
4	Averaging Rate/Type	R/W	User	UINT8	1	See Description	0	2.00	Defines, in conjunction with the Archive Type parameter, how the system archives data to history. For Accumulated Rate (Archive Type 129) valid values are: 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day For Averaging Type (Archive Type 128) valid values are: 0 = None (history point not defined) 4 = Flow Weighted Formulaic 5 = Linear Averaging 6 = User Weighted Averaging (Ver 2.40)
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	2.00	Indicates the current value of the parameter being logged.
6	Last Daily Valu	R/O	System	FL	4	Any valid IEEE 754 float	0	2.00	Value logged to the daily achive at the last contact hour.
7	Today Minimum Time	R/O	System	TIME	4	0 → 4294967296	0	2.00	Time today at which the minimum value was reached
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	2.00	Minimum value of logged parameter observed today
9	Today Maximum Time	R/O	System	TIME	4	0 → 4294967296	0	2.00	Time today at which the maximum value was reached
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	2.00	Maximum value of logged parameter observed today
11	Yesterday Minimum Time	R/O	System	TIME	4	0 → 4294967296	0	2.00	Time yesterday at which the minimum value was reached
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	2.00	Minimum value of logged parameter observed yesterday
13	Yesterday Maximum Time	R/O	System	TIME	4	0 → 4294967296	0	2.00	Time yesterday at which the maximum value was reached
14	Yestreday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	2.00	Maximum value of logged parameter observed yesterday

3.4.64 Point Type 143: History Segment 12 Point Configuration

Description: Point type 143 provides parameters to configure History Segment 12.

Number of Logical Points: Varies, depending on the segment size parameter for History Segment 12

Storage Location: Point type 143 is saved to internal configuration memory.

Table 3-65: Point Type 143, History Segment 12

Point Type 143: History Segment 12

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Point Tag Id.	R/O	User	AC	10	0x20 → 0x7E for each byte	"-"	2.00	A 10 character identification name for a specific APM. Values must be printable ASCII characters.
1	Parameter description	R/W	User	AC	10	0x20 → 0x7E for each byte	"-"	2.00	Idenitfies the parameter being logged in the history point.
2	History Point Log	R/W	User	TLP	3	Any parameter with the exception of data types TLP or AC	0,0,0	2.00	Indicates the value to be archived.
3	Archive Type	R/W	User	UINT8	1	See Description		2.00	Defines how the system archives the data point to history. Valid values are: 0 = None (history point not defined) 1 = User C/C++ data (ver 1.20) 2 = User C/C++ time (ver 1.20) 65 = FST data history 67 = FST time 128 = Average 129 = Accumulated 130 = Currentl Value 134 = Totalize

Point Type 143: History Segment 12

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
4	Averaging Rate/Type	R/W	User	UINT8	1	See Description	0	2.00	Defines, in conjunction with the Archive Type parameter, how the system archives data to history. For Accumulated Rate (Archive Type 129) valid values are: 10 = Per Second 11 = Per Minute 12 = Per Hour 13 = Per Day For Averaging Type (Archive Type 128) valid values are: 0 = None (history point not defined) 4 = Flow Weighted Formulaic 5 = Linear Averaging 6 = User Weighted Averaging (Ver 2.40)
5	Current Value	R/O	System	FL	4	Any valid IEEE 754 float	0	2.00	Indicates the current value of the parameter being logged.
6	Last Daily Valu	R/O	System	FL	4	Any valid IEEE 754 float	0	2.00	Value logged to the daily achive at the last contact hour.
7	Today Minimum Time	R/O	System	TIME	4	0 → 4294967296	0	2.00	Time today at which the minimum value was reached
8	Today Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	2.00	Minimum value of logged parameter observed today
9	Today Maximum Time	R/O	System	TIME	4	0 → 4294967296	0	2.00	Time today at which the maximum value was reached
10	Today Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	2.00	Maximum value of logged parameter observed today
11	Yesterday Minimum Time	R/O	System	TIME	4	0 → 4294967296	0	2.00	Time yesterday at which the minimum value was reached
12	Yesterday Minimum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	2.00	Minimum value of logged parameter observed yesterday
13	Yesterday Maximum Time	R/O	System	TIME	4	0 → 4,294,967,296	0	2.00	Time yesterday at which the maximum value was reached
14	Yestreday Maximum Value	R/O	System	FL	4	Any valid IEEE 754 float	0	2.00	Maximum value of logged parameter observed yesterday

3.4.65 Point Type 144: Transactional History Configuration

Description: Point type 144 provides information for configuring the transaction history for the logical.

Number of Logical Points: 10 logical points (0 → 9) may exist.

Storage Location: Point type 144 is saved to internal configuration memory.

Table 3-66: Point Type 144, Transactional History Configuration

Point Type 144: Transaction History Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Device Tag	R/W	System	UNIT16	2	0 → [max based on memory usage]	0	2.40	Indicates the number of transactions allocated to this logical
1	Device ID	R/O	System	UINT16	2	0 → [max based on memory usage]	0	2.40	Indicates the number of transactions stored for this logical
2	Manufacturing ID	R/O	System	UINT32	4	0 → [max based on memory usage]	0	2.40	Indicates the space reserved for this transaction logical
3	Total Space Remaining	R/O	System	SINT32	4	-2,147,483,648 → 105,480	105,480	2.40	Indicates the space remaining for allocations. This can be a negative value if more data is allocated than space available. However, logicals cannot be locked while this value is negative.
4	Overwrite Switch	R/O	User	UINT8	1	0 → 1	0	2.40	Indicates how the system handles overwrite settings when transaction limit is reached. Valid values are **0** (overwrite settings) or **1** (Stop).
5	Reset Switch	R/W	User	UINT8	1	0 → 1	0	2.40	Reset; clears all transactions for this logical
6	Lock Setting	R/W	User	UINT8	1	0 → 1	0	2.40	Sets locks configured for logical. All transactions have to be cleared for this logical on unlock.
7	Last Transaction Logged	R/O	System	UINT16	2	0 → 65,535	0	2.40	Indicates the last transaction number logged
8	Status	R/O	System	UINT8	1	0 → 3	0	2.40	Indicates the status of the last action on this logical. Valid values are: 0 = No Error 1 = Invalid CRC when retrieving data 2 = Error getting transcation 3 = Segment full

3.4.66 Point Type 145: Transactional History Point Configuration

Description: Point type 145 provides parameters for storing transaction data.

Number of Logical Points: 10 logical points (0 → 9) may exist.

Storage Location: Point type 145 is saved to internal configuration memory.

Table 3-67: Point Type 145, Transactional History Point Configuration

Point Type 145: Transaction History Point Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Write Trigger	R/W	User	UNIT8	1	0 → [max based on memory usage]	0	2.40	Indicates the write trigger. Valid values are 0 (Idle) and 1 (write transaction).
1	Transaction Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“ “	2.40	Transactional description (can be changed without losing transactional history)
2	Point Description	R/W	User	AC	10	0x20 → 0x7E for each byte	“ “	2.40	Point description (can be changed without losing transactional history)
3	Point to Log	R/W	User	TLP	3	Any valid TLP value	0,0,0	2.40	Point to log.
[4…201]									Parameters 2 and 3 (as a pair) repeat 100 times.

3.4.67 Point Type 172: RTU Network Discovery List Point Configuration

Description: Point type 172 provides information for the RTU Network Discover List.

Number of Logical Points: A maximum of 32 logicals (0 → 31) may exist.

Storage Location: Point type 172 is **not** saved to internal configuration memory.

Table 3-68: Point Type 172, RTU Network Discovery List Point Configuration

Point Type 172: RTU Network Discovery List Point Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Write Trigger	R/W	User	AC	10	0x20 → 0x7E for each byte	"No Tag"	2.40	Tag of the Remote RTU.
1	Transaction Description	R/W	User	UINT32	4	0 → 4,294,967,296	0	2.40	Unique ID of the Remote RTU.
2	Point Description	R/W	User	UINT8	1	0 → 12 or 0 → 24	0	2.40	Logical number of the commissioned list point type assigned to this Remote RTU
3	Commission Flat	R/W	User	UINT8	1	0, 1, 255	0	2.40	If **reading**: indicates if this list slot is occupied wth a live non-commissioned device. Valid values are 0 (Empty) and 1 (Occupied). If **writing**, commissions this device to the specified Commissioned List Index.

3.4.68 Point Type 173: Network Commissioned List

Description: Point type 173 provides information for the Network Commissioned List.

Number of Logical Points: A maximum of 24 logicals (0 → 23) may exist.

Storage Location: Point type 173 is saved to internal configuration memory.

Table 3-69: Point Type 173, Network Commissioned List

Point Type 173: Network Commissioned List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag	R/O-R/W	System	AC	10	0x20 → 0x7E for each byte	"No Tag"	2.40	Tag of the device
1	ROC Device ID	R/O-R/W	System	UINT32	4	0 → 4,294,967,296	0	2.40	Unique ID of the commissioned device
2	Network ID	R/O-R/W	System	UINT8	1	0 → 255	0	2.40	Network ID
3	ROC Group Address	R/O-R/W	System	UINT8	1	0 → 255	0	2.40	ROC Group Address
4	ROC Unit Address	R/O-R/W	System	UINT8	1	0 → 255	0	2.40	ROC Unit Address
5	ROC Type	R/O-R/W	System	UINT8	1	0 → 65535	0	2.40	ROC Type
6	RTU Backplane Type and Slot Usage	R/O-R/W	System	UINT32	4	0 → 4,294,967,296	0	2.40	Indicates the RTU backplane type and slot usage. Bits 0-2: For the 100-Series: 0 = 4 slot 1 = 8 slot For the 800-Series: 0 = 3 slot 1 = 9 slot 2 =- 15 slot 3 = 21 slot 4 = 27 slot Bits 3-31: Slot in use for slots 0-27
7	Device Status	R/W	System	UINT8	1	0 → 255	0	2.40	Indicates the device's integrity status. Valild values are: 0 = Good Bit 1: 1 = I/O Integrity Fail Bit 2: 1 = I/O Alarm Fail Bit 3: 1 = Stale Data on Device Bit 7: 1 = Identifying **Note**: For ROC800s, the device status reports only the Device Status Good bit, the Stale Data on Device bit, and the Identifying bit.

Point Type 173: Network Commissioned List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
8	Comm State	R/O	System	UINT8	1	0 → 255	0	2.40	Indicates the device's communication status. Valid values are **0** (Good) and **1** (Comm Fail).
9	Battery Voltage	R/O	System	FL	4	Any valid IEEE 754 float	0.0	2.40	Indicates the battery voltage on the ROC
10	Signal Strength	R/O	System	UINT8	1	0 → 127	0.0	2.40	Indicates the strength of the radio signal. Units are FreeWave J, which is 0-127 value.
11	Noise Level	R/O	System	UINT8	1	0 → 127	0	2.40	Indicates the strength of the radio signal. Units are FreeWave J, which is 0-127 value.
12	Percent Packets Good from Master	R/O	System	UINT8	1	0 → 127	0	2.40	Percent of packets received as good from master radio.
13	Network Configuration Revision	R/O	System	UINT16	2	0 → 65535	0	2.40	Indicates the revision of the network configuration.
14	Decommision Flag	R/W	User	UINT8	1	0, 1, 255	0	2.40	When **reading**, indicates if the device is decommissions. Valid values are **0** (Not commissioned) and **1** (Commissioned). When **writing**, valid values are **0** (Not commissioned), **1** (Commissioned), and **255** (decommission device)..
15	Reflected Power from Radio	R/O	System	FL	4	Any valid IEEE 754 float	0.0	2.40	Reflected power from radio in dBm.
16	Passthru Enabled	R/W	User	UINT8	1	0 → 1	0	2.40	Allows passthru to the remote node. Valid values are **0** (disabled) and **1** (passthru enabled)
17	Passthru Outgoing Message Count	R/W	User	UINT32	4	0 → 4,294,967,296	0	2.40	Outgoing passthrough message counter. The system resets this parameter to 0 after any type of restart.

3.4.69 Point Type 174: Network Export Data

Description: Point type 174 provides information for network export data.

Number of Logical Points: A maximum of 30 logicals (0 → 29) may exist.

Storage Location: Point type 174 is saved to internal configuration memory.

Table 3-70: Point Type 174, Network Export Data

Point Type 174: Network Export Data

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag	R/W	User	AC	10	0x20 → 0x7E for each byte	"No Tag"	2.40	Tag of the selected export value
1	Export TLP	R/W	User	TLP	4	Any valid TLP value	0	2.40	TLP of the parameter to be exported.
2	Network ID	R/W	User	UINT8	1	0 → 255	0	2.40	Network ID
3	Data ID	R/W	User	UINT16	1	0 → 65535	0	2.40	Unique ID associated with this TLP used to map the value on the import side. Zero (**0**) indicates the logical is empty.
4	Value	R/O	System	FL	4	Any valid IEEE 754 float	0.0	2.40	Current value olf the export TLP. The system updates this parameter at the time of export.

3.4.70 Point Type 175: Network Import Data

Description: Point type 175 provides information for network import data.

Number of Logical Points: A maximum of 128 logicals (0 → 127) may exist.

Storage Location: Point type 175 is saved to internal configuration memory.

Table 3-71: Point Type 175, Network Import Data

Point Type 175: Network Import Data

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Tag	R/W	User	AC	10	0x20 → 0x7E for each byte	"No Tag"	2.40	Tag of the selected import value
1	Network ID	R/W	User	UINT8	4	Any valid TLP value	0	2.40	Network ID
2	Data ID	R/W	User	UINT16	1	0 → 255	0	2.40	Unique ID associated with this TLP used to map the value on the import side. Zero indicates the logical is empty.
3	Value	R/O	System	FL	4	Any valid IEEE 754 float	0.0	2.40	The current value
4	Health/Status	R/O	User	UINT8	1	0 → 255	0	2.40	The health or status of the imported value. Valid values are: 0 = Good 1 = Data not updated (Stale) 2 = Remote Point Fail 3 = Point in Alarm
5	Fault Value	R/W	User	FL	4	Any valid IEEE 754 float	0.0	2.40	Default value for the imported value if a fault condition occurs. A fault condition is defined as a status other than Good in the Health/Status parameter (#4).
6	Fault Enable	R/W	User	UINT8	1	0 → 1	0	2.40	Enables the fault value. Valid values are **0** (Disable) and **1** (Enable).
7	RESERVED							2.40	Reserved for future use.
8	Source (R)RTU	R/W	User	UINT8	1	0 → 255	0	2.40	Network device ID of the remote RTU from which the TLP is being imported
9	Forward TLP	R/W	User	TLP	4	Any valid TLP value	0,0,0	2.40	TLP to receive imported value

3.4.71 Point Type 176: IEC62591 Live List Configuration

Description: Point type 176 provides information for the IEC 62591 live list.

Number of Logical Points: 60 logical points (0 → 59) may exist.

Storage Location: Point type 176 is **not** saved to internal configuration memory.

Table 3-72: Point Type 176, IEC62591 Live List Configuration

Point Type 176: IEC62591 Live List

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Device Tag	R/O	System	AC	10	0x20 → 0x7E for each byte	"No Tag"	2.30	Device tag.
1	Device ID	R/O	System	UINT32	4	0 → 65535	0	2.30	Device ID
2	Manufacturing ID	R/O	System	UINT16	2	0 → 65535	0	2.30	Manufacturer ID
3	Device Type	R/O	System	UNIT16	2	0 → 65535	0	2.30	Device type.
4	Commissioned List Index	R/W	System	UINT8	1	0 →59	0	2.30	Logical number of the commissioned list point type assigned to this wireless device.
5	Commission Flag	R/W	System	UINT8	1	0, 1, 254, 255	0	2.30	When reading, this parameter indicates if this live list slot is occupied with a live non-commissioned device. Valid values are **0** (Emtpy) and **1** (Occupied). When writing, this parameter commissions this device to the specified Commissioned List Index. Valid values are **254** (commission a new device) and **255** (commission a replacement device).

3.4.72 Point Type 177: IEC62591 Commissioned List Configuration

Description: Point type 177 provides information for the IEC62591 Commissioned List.

Number of Logical Points: 60 logical points (0 → 59) may exist.

Storage Location: Point type 177 is saved to internal configuration memory.

Table 3-73: Point Type 177, IEC62591 Commissioned List

Point Type 177: IEC62591 Commissioned List Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
0	Device Tag	R/W		AC	40	0x20 → 0x7E for each byte	"No Tag"	2.20	A 40 character tag that resides in the device.
1	Device Manager	R/W		AC	40	0x20 → 0x7E for each byte	"No Message"	2.20	Device message
2	Device Description	R/W		AC	20	0x20 → 0x7E for each byte	"No Descriptor"	2.20	Device description
3	Transducer Serial Number	R/O		UINT32	4	0 → 4,294,967,295	0	2.20	Device serial number
4	Device ID	R/O		UINT32	4	0 → 4,294,967,295	0	2.20	Device ID
5	Manufacturer ID	R/O		UINT16	2	0 → 65535	0	2.20	Manufacturer ID
6	Device Type	R/O		UINT16	2	0 → 65535	0	2.20	Device type
7	Adapter ID	R/O		UNIT32	4	0 → 4,294,967,295	0	2.20	Adapter ID
8	Adapter Type	R/O		UINT16	2	0 → 65535	0	2.20	Adapter type
9	De-commission Flag	R/W		UINT8	1	0, 1, 255	0	2.20	Indicates either device's commissioned status or whether to decommission a device. When read, valid values are 0 (not commissioned) and 1 (commissioned). When written, valid value is 255 (de-commission device).
10	Battery Life	R/O		UINT16	2	0 → 65535	0	2.20	Indicates the battery life remaining in days. If the device does not have a battery or other energy storage component, then the device may return 0xFFFF.
11	Latched Response Status	R/O		UNIT8	1	0 → 255	0	2.20	Latched response status.
12	Poll Mode	R/W		UNIT8	1	0 → 1	0	2.20	Indicates the polling mode. Valid values are **0** (normal polling of dynamic and slot variables) and **1** (update all static and dynamic device parameters. **Note**: After the update completes, the module automatically sets this parameter back to **0**.

Point Type 177: IEC62591 Commissioned List Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
13	Burst Rate	R/W		UINT16	2	0 → 65535	10	2.20	Indicates the burst rate (in seconds) used for polling process variables.
14	Communication Status	R/O		UINT8	1	0 → 1	0	2.20	Indicates the device’s communication status. Valid values are **0** (OK) and **1** (Communication Failure).
15	Loop Current	R/O		FLOAT	4	Any valid IEEE 754 float	0.0	2.20	Indicates the device’s loop current (in mA).
16	Primary Variable Value	R/W		FLOAT	4	Any valid IEEE 754 float	0.0	2.20	Value of primary variable.
17	Primary Variable Units	R/O		UINT8	1	0 → 255	0	2.20	Units code for primary variable
18	Secondary Variable Value	R/W		FLOAT	4	Any valid IEEE 754 float	0.0	2.20	Value of secondary variable.
19	Secondary Variable Value	R/O		UINT8	1	0 → 255	0	2.20	Units code for secondary variable
20	Tertiary Variable Value	R/W		FLOAT	4	Any valid IEEE 754 float	0.0	2.20	Value of tertiary variable.
21	Tertiary Variable Value	R/O		UINT8	1	0 → 255	0	2.20	Units code for tertiary variable
22	Quaternary Variable Value	R/W		FLOAT	4	Any valid IEEE 754 float	0.0	2.20	Value of quaternary variable.
23	Quaternary Variable Value	R/O		UINT8	1	0 → 255	0	2.20	Units code for quaternary variable
24	Device Status	R/O		UNIT8	1	0 → 8	0	2.20	Indicates the status of the wireless device. Valid values are: Commissioning Process: 0 = Idle 1 = Configuring Burst Message 2 = Configuring Burst Variable 3 = Configuring Burst Rate 4 = Enabling Bursting Commissioned States 5 = Bursting (Green) 6 = Values Stale (Yellow) 7 = Communication Failure (Red) Decommissioning Process 8 = Disabling Bursting
25	Slot Variable 0 Assignment	R/W		UINT8	1	0 → 255	250	2.20	Slot 0 variable to request
26	Slot 0 Units	R/O		UINT8	1	0 → 255	0	2.20	Units of slot 0 variable
27	Slot 0 Value	R/W		FLOAT	4	Any valid IEEE 754 float	0.0	2.20	Value of slot 0 variable
28	Slot Variable 1 Assignment	R/W		UINT8	1	0 → 255	250	2.20	Slot 1 variable to request
29	Slot 1 Units	R/O		UINT8	1	0 → 255	0	2.20	Units of slot 1 variable

Point Type 177: IEC62591 Commissioned List Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
30	Slot 1 Value	R/W		FLOAT	4	Any valid IEEE 754 float	0.0	2.20	Value of slot 1 variable
31	Slot Variable 2 Assignment	R/W		UINT8	1	0 → 255	250	2.20	Slot 2 variable to request
32	Slot 2 Units	R/O		UINT8	1	0 → 255	0	2.20	Units of slot 2 variable
33	Slot 2 Value	R/W		FLOAT	4	Any valid IEEE 754 float	0.0	2.20	Value of slot 2 variable
34	Slot Variable 3 Assignment	R/W		UINT8	1	0 → 255	250	2.20	Slot 3 variable to request
35	Slot 3 Units	R/O		UINT8	1	0 → 255	0	2.20	Units of slot 3 variable
36	Slot 3 Value	R/W		FLOAT	4	Any valid IEEE 754 float	0.0	2.20	Value of slot 3 variable
37	Number Discrete Channel	R/O	System	UINT8	1	0 → 4	0	1.40	Number of discrete channels
38	Discrete Chan 1 Set Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 1 classification for the setpoint
39	Discrete Chan 1 Live Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 1 classification of the device for the live value
40	Discrete Chan 1 Set Point	R/W	Both	UINT16	2	0 → 65535	0	1.40	Discrete Channel 1 setpoint
41	Discrete Chan 1 Live Value	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 1 live value
42	Discrete Chan 2 Set Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 2 classification for the setpoint
43	Discrete Chan 2 Live Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 2 classification of the device for the live value
44	Discrete Chan 2 Set Point	R/W	Both	UINT16	2	0 → 65535	0	1.40	Discrete Channel 2 setpoint
45	Discrete Chan 2 Live Value	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 2 live value
46	Discrete Chan 3 Set Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 3 classification for the setpoint
47	Discrete Chan 3 Live Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 3 classification of the device for the live value
48	Discrete Chan 3 Set Point	R/W	Both	UINT16	2	0 → 65535	0	1.40	Discrete Channel 3 setpoint
49	Discrete Chan 3 Live Value	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 3 live value
50	Discrete Chan 4 Set Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 4 classification for the setpoint
51	Discrete Chan 4 Live Class	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 4 classification of the device for the live value
52	Discrete Chan 4 Set Point	R/W	Both	UINT16	2	0 → 65535	0	1.40	Discrete Channel 4 setpoint
53	Discrete Chan 4 Live Value	R/O	System	UINT16	2	0 → 65535	0	1.40	Discrete Channel 4 live value
54	Process Variable Failsafe Mode	R/W	User	FL	4	Any valid IEEE 754 float	0	1.40	Determine the action on failure. Valid values are **0** (use last process variable values) and **1** (use failsafe value).

Point Type 177: IEC62591 Commissioned List Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
55	Primary Variable Fault Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.40	Value for the primary variable value when the Failsafe Mode is set to **Use Failsafe Value** and the Field Device Status (177,x,11) indicates a non-primary process variable is out of range, a communication failure occurs, or a NaN is detected for the value.
56	Secondary Variable Faut Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.40	Value for the seconedary variable value when the Failsafe Mode is set to **Use Failsafe Value** and the Field Device Status (177,x,11) indicates a non-primary process variable is out of range, a communication failure occurs, or a NaN is detected for the value.
57	Tertiary VariableFault Value	R/W	User	FL	4	Any valid IEEE 754 float	0	1.40	Value for the trertiary variable value when the Failsafe Mode is set to **Use Failsafe Value** and the Field Device Status (177,x,11) indicates a non-primary process variable is out of range, a communication failure occurs, or a NaN is detected for the value.
58	Quaternary Variable Failsafe Mode	R/W	User	FL	4	Any valid IEEE 754 float	0	1.40	Value for the quaternary variable value when the Failsafe Mode is set to **Use Failsafe Value** and the Field Device Status (177,x,11) indicates a non-primary process variable is out of range, a communication failure occurs, or a NaN is detected for the value.
59	NaN Flag	R/O	System	BIN	1	0 → 255	0	1.40	
59.0	PV NaN Flag		Bit 0						Indicates the PV value is not a number at the device
59.1	SV NaN Flag		Bit 1						Indicates the SV value is not a number at the device
59.2	TV NaN Flag		Bit 2						Indicates the TV value is not a number at the device
59.3	QA NaN Flag		Bit 3						Indicates the QV value is not a number at the device
59.4	Slot 1 NaN Flag		Bit 4						Indicates the slot 1 value is not a number at the device
59.5	Slot 2 NaN Flag		Bit 5						Indicates the slot 2 value is not a number at the device
59.6	Slot 3 NaN Flag		Bit 6						Indicates the slot 3 value is not a number at the device
59.7	Slot 4 NaN Flag		Bit 7						Indicates the slot 4 value is not a number at the device

Point Type 177: IEC62591 Commissioned List Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
60	PV Device Variable Status	R/O	System	BIN	1	0 → 255	0	2.33	PV Device Variable Status byte, which indicates for the primary variable: Bit 0-2 - Device Family Specific Status Bit 3 - More Device Variable Status Available Bits 4-5 - Limit Status 00 = Not Limited 01 = Low Limited 10 = High Limited 11 = Constant Bits 6-7 – Process Data Status 00 = Bad 01 = Poor Accuracy 10 = Manual / Fixed 11 = Good
61	SV Device Variable Status	R/O	System	BIN	1	0 → 255	0	2.33	SV Device Variable Status byte, which indicates for the secondary variable: Bit 0-2 - Device Family Specific Status Bit 3 - More Device Variable Status Available Bits 4-5 - Limit Status 00 = Not Limited 01 = Low Limited 10 = High Limited 11 = Constant Bits 6-7 – Process Data Status 00 = Bad 01 = Poor Accuracy 10 = Manual / Fixed 11 = Good
62	TV Device Variable Status	R/O	System	BIN	1	0 → 255	0	2.33	TV Device Variable Status byte, which indicates for the tertiary variable: Bit 0-2 - Device Family Specific Status Bit 3 - More Device Variable Status Available Bits 4-5 - Limit Status 00 = Not Limited 01 = Low Limited 10 = High Limited 11 = Constant Bits 6-7 – Process Data Status 00 = Bad 01 = Poor Accuracy 10 = Manual / Fixed 11 = Good

Point Type 177: IEC62591 Commissioned List Configuration

Param#	Name	Access	System or User Update	Data Type	Length	Range	Default	Ver	Description of functionality and meaning of values
63	QV Device Variable Status	R/O	System	BIN	1	0 → 255	0	2.33	QV Device Variable Status byte, which indicates for the quaternary variable: Bit 0-2 - Device Family Specific Status Bit 3 - More Device Variable Status Available Bits 4-5 - Limit Status 00 = Not Limited 01 = Low Limited 10 = High Limited 11 = Constant Bits 6-7 – Process Data Status 00 = Bad 01 = Poor Accuracy 10 = Manual / Fixed 11 = Good
64	Discrete Variable Status 1	R/O	System	BIN	1	0 →3	0	2.33	Bitwise field indicating statuses of the discrete variables. Bit 0 – Discrete variable in Simulation or Local Override Bit 1 – Discrete variable in Fault Mode Bit 2-7 – Reserved
65	Discrete Variable Status 2	R/O	System	BIN	1	0 →3	0	2.33	Bitwise field indicating statuses of the discrete variables. Bit 0 – Discrete variable in Simulation or Local Override Bit 1 – Discrete variable in Fault Mode Bit 2-7 – Reserved
66	Discrete Variable Status 3	R/O	System	BIN	1	0 →3	0	2.33	Bitwise field indicating statuses of the discrete variables. Bit 0 – Discrete variable in Simulation or Local Override Bit 1 – Discrete variable in Fault Mode Bit 2-7 – Reserved
67	Discrete Variable Status 4	R/O	System	BIN	1	0 →3	0	2.33	Bitwise field indicating statuses of the discrete variables. Bit 0 – Discrete variable in Simulation or Local Override Bit 1 – Discrete variable in Fault Mode Bit 2-7 – Reserved

Chapter 4 – CRC-16 Code

The ROC Plus protocol applies a cyclical redundancy check (CRC) to the message string to produce a 16-bit remainder. This remainder is referred to as the CRC-16 code. The CRC-16 code is appended to the end of the message string.

The DL8000 uses the 16-bit polynomial CRC-16:

X16 + X15 + X2 + 1

The DL8000 uses the standard GPLIB CRC routine, and calculates CRC by table lookup, with the initial condition (seed) of 0000 (zeros).

DL8000 Address		Host Address		Opcode	Data Length	8 Data Bytes			CRC	
unit	group	unit	group	–	# of bytes	d1	d2	d3	LSB	MSB
1	2	1	0	17	3	‘M’	‘O’	‘C’	133	24

Note: Ethernet communication ignores the CRC, since TCP/IP protocol already does error checking. However, the CRC still needs to be sent over Ethernet communications.

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Chapter 5 – IEEE Floating Point Format

In general, the DL8000 uses IEEE format for binary representation of floating-point numbers.

The single-precision format consists of a sign bit, 8-bit biased exponent, and a 23-bit mantissa. The sign bit is either **0** for positive or **1** for negative.

Sign-m	Exponent		Mantissa	
1 bit	8 bits		23 bits	
31	30	23	22	0

The double-precision format consists of a sign bit, 11-bit biased exponent, and a 52-bit mantissa. The sign bit is either **0** for positive or **1** for negative.

Sign-m	Exponent		Mantissa	
1 bit	11 bits		52 bits	
63	62	52	51	0

And, the following binary representation of integers:

Integer format:

LSB	MSB

Long Integer format:

LSB	LSB +1	MSB – 1	MSB

Single Precision Floating Point format:

LSB	LSB +1	MSB – 1	MSB

Double Precision Floating Point format:

LSB	LSB + 1	LSB+2	LSB+3	MSB - 3	MSB - 2	MSB – 1	MSB

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Chapter 6 – Spontaneous-Report-By-Exception

This section details the sequence of events describing the DL8000 Spontaneous-Report-by-Exception (SRBX or RBX)

1. An alarm occurs, which enables the spontaneous report by exception.
2. The DL800 sends a request to the host computer at the next available chance. The request from the DL8000 appears as:

DL8000 Request to Host Computer

Host Address		**DL8000 Address**		**Opcode**	**Data Length**	**CRC**	
unit	group	unit	group	–	# of bytes	LSB	MSB
1	0	1	2	224	0	232	45

3. The host computer receives the report-by-exception request from the DL8000 and begins a general update of any existing alarms.
4. Once the host computer finishes polling the DL8000, the host computer acknowledges the DL8000's Spontaneous-Report-by-Exception request by sending a pointer to the last alarm received and appears as follows:

Host Computer Response to DL8000

DL8000 Address		**Host Address**		**Opcode**	**Data Length**	**8 Data Bytes**		**CRC**	
unit	group	unit	group	–	# of bytes	d1	d2	LSB	MSB
1	2	1	0	225	2	7	0	118	17

Note: The alarm index is 7.

5. The DL8000 compares the index, determines if the host computer has polled for all outstanding alarms, and then clears the report-by-exception status.

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Chapter 7 – Device-to-Device Communications

Store and forward messages can be received on any DL8000 communications port. They are then transmitted out any port that has enabled the store and forward port feature.

Opcode 24 defines the requested store and forward action (refer to *Table 7-1*). This opcode follows the general protocol message format used for DL8000 communications, with the exception that there is an embedded message within the message.

Note: Each message can be a maximum of 255 bytes.

Table 7-1. Opcode 24

Opcode 24						
Communi-cation Opcode	Host Request to DL8000			DL8000 Response to Host		
	Data		Description of Data	Data		Description of Data
	Offset	Length		Offset	Length	
Opcode 24: Store and Forward	6	1	Host Address			No response sent back.
	7	1	Host Group			
	8	1	1st Destination Address			
	9	1	1st Destination Group			
	10	1	2nd Destination Address			
	11	1	2nd Destination Group			
	12	1	3rd Destination Address			
	13	1	3rd Destination Group			
	14	1	4th Destination Address			
	15	1	4th Destination Group			
	16	1	Desired Opcode			
	17	1	Number of data bytes for the desired Opcode			
	18	x	Opcode data			

Specify the address and group as **(0,0)** for the destinations that are not used.

The following example reads the clock, where the message is forwarded through one DL8000 to the last DL8000. For this example, the desired path of communication is Host (1,0), DL8000#1 (1,2), DL8000#2 (2,2).

Host Request to DL8000#1:

Destination Address		Source Address			
Unit	Group	Unit	Group	Opcode	Number Bytes
1	2	1	0	24	12

Communication Path									
Unit	Group	Unit	Group	Unit	Group	Unit	Group	Unit	Group
1	0	1	2	2	2	0	0	0	0

Opcode	Number Bytes	CRC	
		LSB	MSB
7	0	X	X

DL8000#1 Request to ROC2 (final destination):

Destination Address		Source Address			
Unit	Group	Unit	Group	Opcode	Number Bytes
2	2	1	2	24	12

Communication Path									
Unit	Group	Unit	Group	Unit	Group	Unit	Group	Unit	Group
1	0	1	2	2	2	0	0	0	0

Opcode	Number Bytes	CRC	
		LSB	MSB
7	0	X	X

DL8000#2 Response Back to DL8000#1:

Destination Address		Source Address			
Unit	Group	Unit	Group	Opcode	Number Bytes
1	2	2	2	24	20

Communication Path									
Unit	Group	Unit	Group	Unit	Group	Unit	Group	Unit	Group
1	0	1	2	2	2	0	0	0	0

Op-code	# of Bytes	d1	d2	d3	d4	d5	d6	d7	d8	CRC LSB	CRC MSB
7	8	Sec	Min	Hour	Day	Month	Year	Leap Year	Day of Week	–	–

DL8000#1 Request to Host:

Host Address		ROC Address			
Unit	Group	Unit	Group	Opcode	Number Bytes
1	0	1	2	24	20

Communication Path									
Unit	Group	Unit	Group	Unit	Group	Unit	Group	Unit	Group
1	0	1	2	2	2	0	0	0	0

Op-code	**# of Bytes**	**d1**	**d2**	**d3**	**d4**	**d5**	**d6**	**d7**	**d8**	**CRC LSB**	**CRC MSB**
7	8	Sec	Min	Hour	Day	Month	Year	Leap Year	Day of Week	–	–

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